Fisheries and Oceans Canada | Pêches et Océans Canada
Science | Sciences

C S A S | **S C C S**

Canadian Science Advisory Secretariat | **Secrétariat canadien de consultation scientifique**

Research Document 2004/108 | **Document de recherche 2004/108**

2004 Summer Groundfish Survey update for selected Scotia-Fundy groundfish stocks.

Mise à jour du relevé de l'été 2004 sur les poissons de fond pour les stocks particuliers du plateau néo-écossais et de la baie de Fundy.

R. Branton and G. Black

Department of Fisheries and Oceans
Maritimes Region, Science Branch
Bedford Institute of Oceanography
1 Challenger Drive, Dartmouth
Nova Scotia, B2Y 4A2
Canada

ISSN 1499-3848 (Printed / Imprimé)

Canada

Abstract

A synopsis of the results of the 2004 DFO summer bottom trawl survey on the Scotian Shelf and Bay of Fundy is provided. Survey trends for each stock from 1970 to present are shown as a series of graphs and expanding symbol maps. This information is used in assessment meetings as a key source of information on trends for selected groundfish stocks.

Résumé

Un résumé des résultats du relevé au chalut de fond qui a été effectué pendant l'été de 2004 par le Ministère des Pêches et des Océans dans les eaux du plateau néo-écossais et de la baie de Fundy est présenté. Les tendances pour chaque stock dans les relevés de 1970 jusqu'à aujourd'hui sont présentées sous forme d'une série de graphiques et de cartes de distribution. Ces résultats sont utilisés lors de réunions d'évaluation comme principale source d'information sur les tendances des stocks de poisson de fond sélectionnés.

INTRODUCTION

Introduction

The annual groundfish bottom trawl survey was conducted by DFO on the Scotian Shelf and Bay of Fundy as planned 5 July to 30 July 2004. The results of this survey were compiled for selected stocks to provide clients with a preliminary view of biomass, abundance, resource concentration, area occupied, size composition, and distribution as determined by the survey. The groundfish stocks covered by the report and the lead scientific investigator are listed in Table 1. The distribution of sampling effort compared with the past three years is shown in Figures 1 to 4. Survey trends for each stock from 1970 to present are shown in Figures 5 to 112. Mean weight and number caught per tow and long term frequency distribution time series are not adjusted for the research vessel and survey gear changes which occurred in 1982-3, and 2003-4. Fanning (1985) reported vessel conversion factors from comparative fishing experiments, which are large for some species. The comparative fishing experiment has yet to be performed between the CCGS Needler used for the period 1983-2003, and the CCGS Teleost used in 2004. As a result no calibration factor has been calculated, and the abundance estimates for the 2003 and 2004 surveys are not comparable. The 2004 survey points are shown as separate symbols to highlight this issue in the time series graphs.

Branton and Black (1999, 2000, 2001, 2002, 2003) reported similar results for the 1999 - 2003 surveys. The figures in the 2003 Branton and Black document contain incorrectly calculated stratified mean weight and number per tow values (Fig. 5, 9, 13, 17, 21, 25, 29, 33, 37, 41, 45, 49, 53, 57, 61, 65, 69, 73, 77, 81, 85, 89, 93, 97, 101, 105, and 109). The matching figures in this document provide the corrected time series graphs with the addition of the 2004 survey point. This does not in our opinion alter interpretation of the plots. This document also includes the resource concentration, prevalence, and CPUE where present indicators which measure demersal fish population distribution (Halliday, 2001). An estimate of resource prevalence is the proportion of sets containing the species of interest. This provides an indication of how widely the species is distributed within the survey area without reference to density. A third distribution index, CPUE where present, is the average of the log (non-zero catches) and is indicative of the average local density.

Comprehensive interpretations of stock status are contained in stock assessment documents prepared annually for many of the stocks described here (http://www.dfo-mpo.gc.ca/csas/). Such reports contain information on commercial fishery catch rates and other survey results when available. Therefore, the abundance trends reported here, based on the survey information only, are not directly comparable to those provided in recent assessments.

Survey Description

The 34th annual Scotian Shelf summer groundfish survey was conducted from the research vessel CCGS *Teleost* out of the Bedford Institute of Oceanography, Dartmouth, N.S., on two trips TEL2004529 (5-16 July 2004) and TEL2004530 (18 July - 30 July 2004). The survey was conducted using the standard protocol (Koeller, 1981). Two hundred and thirty one fishing stations, from the Upper Bay of Fundy to the northern tip of Cape Breton and offshore to the 400 fathom contour, were completed.

Samples were obtained with a Western IIA bottom trawl towed for 30 minutes at a speed of 3.5 knots. The trawl has a 106 foot roller-rigged footrope and 2000 pound Portuguese doors. The codend is lined with 3/4 inch mesh to retain small fish. All finfish and major invertebrate species caught were sampled for length and weight and some species were sampled additionally for otoliths to determine age, for evidence of sexual maturity and for stomach contents. Vertical profiles of temperature, salinity, nutrients and oxygen were observed at all fishing stations.

References

Branton, R. and J. Black. 1999. 1999 Summer Groundfish Survey update for selected Scotia-Fundy groundfish stocks. CSAS Res Doc. 99/151. 60p.

Branton, R. and G. Black. 2000. 2000 Summer Groundfish Survey update for selected Scotia-Fundy groundfish stocks. CSAS Res Doc. 2000/129. 61p.

Branton, R. and G. Black. 2001. 2001 Summer Groundfish Survey update for selected Scotia-Fundy groundfish stocks. CSAS Res Doc. 2000/096. 63 p.

Branton, R. and G. Black. 2002. 2002 Summer Groundfish Survey update for selected Scotia-Fundy groundfish stocks. CSAS Res Doc. 2001/089. 62 p.

Branton, R. and G. Black. 2003. 2003 Summer Groundfish Survey update for selected Scotia-Fundy groundfish stocks. CSAS Res Doc. 2003/089. 60 p.

Fanning, L.P. 1985. Intercalibration of research vessel survey results obtained by different vessels. CAFSAC Res. Doc. 85/3: 43p.

Halliday, R.G. 2001. Proceedings of the Fisheries Management Studies Working Group (15-16 and 31 May 2001). CSAS Proc. Ser. 2001/21. 82p.

Koeller, P. 1981. Manual for groundfish survey personnel - cruise preparation, conduct and standing orders. DFO Marine Fish Division Laboratory Reference No. 81/3.

Table 1. Stock name, figure list, page list, as well as name, telephone number and email address of the lead investigator for groundfish stocks observed on 2003 summer bottom trawl survey.

Stock	Figures	Pages	Investigator	Telephone	E-mail
4Vn Cod*	5 - 8	9-10	Showell	(902) 426-3501	ShowellM@mar.dfo-mpo.gc.ca
4VsW Cod*	9 - 12	11-12	Mohn	(902) 426-3190	MohnR@mar.dfo-mpo.gc.ca
4X Cod*	13 - 16	13-14	Clark	(506) 529-8854	ClarkD@mar.dfo-mpo.gc.ca
4VW Haddock*	17 - 20	15-16	Mohn	(902) 426-4592	MohnR@mar.dfo-mpo.gc.ca
4X Haddock*	21 - 24	17-18	Hurley	(902) 426-3520	HurleyP@mar.dfo-mpo.gc.ca
4VWX Pollock*	25 - 28	19-20	Neilson	(506) 529-8854	NeilsonJ@mar.dfo-mpo.gc.ca
Unit 3 Redfish	29 - 32	21-22	Branton	(902) 426-3537	BrantonB@mar.dfo-mpo.gc.ca
4VW Plaice*	33 - 36	23-24	Fowler	(902) 426-3529	FowlerM@mar.dfo-mpo.gc.ca
4VW Yellowtail*	37 - 40	25-26	Fowler	(902) 426-3529	FowlerM@mar.dfo-mpo.gc.ca
4VW Witch*	41 - 44	27-28	Fowler	(902) 426-3585	FowlerM@mar.dfo-mpo.gc.ca
4VW Winter Flounder	45 - 48	29-30	Fowler	(902) 426-3529	Fowler@mar.dfo-mpo.gc.ca
4X Plaice	49 - 52	31-32	Fowler	(902) 426-3316	Fowler@mar.dfo-mpo.gc.ca
4X Yellowtail	53 - 58	33-34	Fowler	(902) 426-3529	Fowler@mar.dfo-mpo.gc.ca
4X Witch	57 - 60	35-36	McRuer	(902) 426-3585	McruerJ@mar.dfo-mpo.gc.ca
4X Winter Flounder	61 - 64	37-38	Fowler	(902) 426-3529	FowlerM@mar.dfo-mpo.gc.ca
4VWX Halibut	65 - 68	39-40	Armsworthy	(902) 426-3310	ArmsworthyS@mar.dfo-mpo.gc.ca
4VWX Silver Hake*	69 - 72	41-42	Showell	(902) 426-3501	ShowellM@mar.dfo-mpo.gc.ca
4VsW Winter Skate	73 - 76	43-44	Simon	(902) 426-4136	SimonJ@mar.dfo-mpo.gc.ca
4VWX Monkfish	77 - 80	45-46	Stobo	(902) 426-3515	StoboW@mar.dfo-mpo.gc.ca
4VW White Hake	81 - 84	47-48	Bundy	(902) 426-8353	BundyA@mar.dfo-mpo.gc.ca
4X White Hake	85 - 88	49-50	Bundy	(902) 426-8353	BundyA@mar.dfo-mpo.gc.ca
4VWX Wolffish*	89-92	51-52	McRuer	(902) 426-3310	McruerJ@mar.dfo-mpo.gc.ca

Stock	Figures	Pages	Investigator	Telephone	E-mail
4VWX Cusk	93-96	53-54	Harris	(902) 426-5418	HarrisL@mar.dfo-mpo.gc.ca
4VW Lumpfish	97-100	55-56	Wilson	(902) 426-3318	WilsonS@mar.dfo-mpo.gc.ca
4X Lumpfish	101-104	57-58	Wilson	(902) 426-3318	WilsonS@mar.dfo-mpo.gc.ca
4VW Turbot	105-108	59-60	Stobo	(902) 426-3316	StoboW@mar.dfo-mpo.gc.ca
4VWX Spiny Dogfish	109-112	61-62	Campana	(902) 426-3233	CampanaS@dfo-mpo.gc.ca

***** was assessed in 2004.

Stock Status reports are available at http://www.dfo-mpo.gc.ca/csas/.

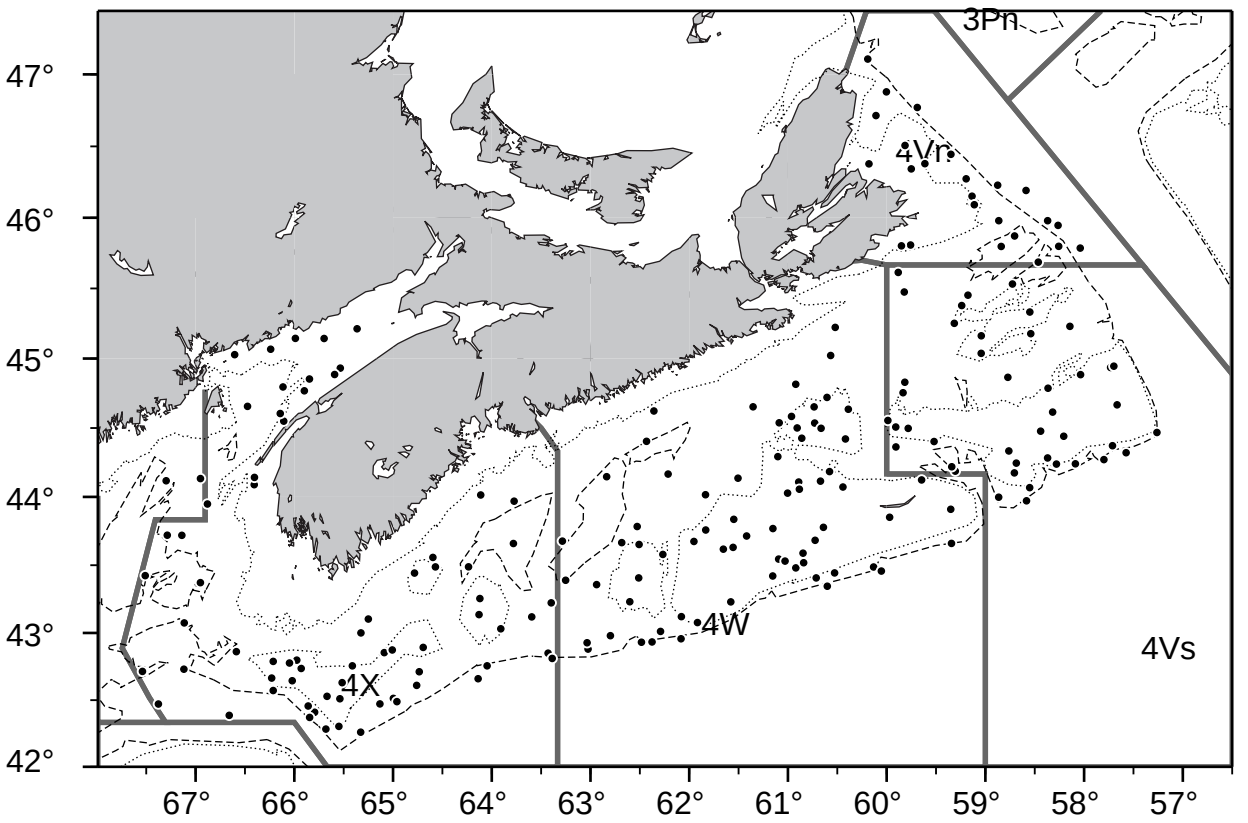

Fig. 1. SUMMER Groundfish Survey Positions 2001

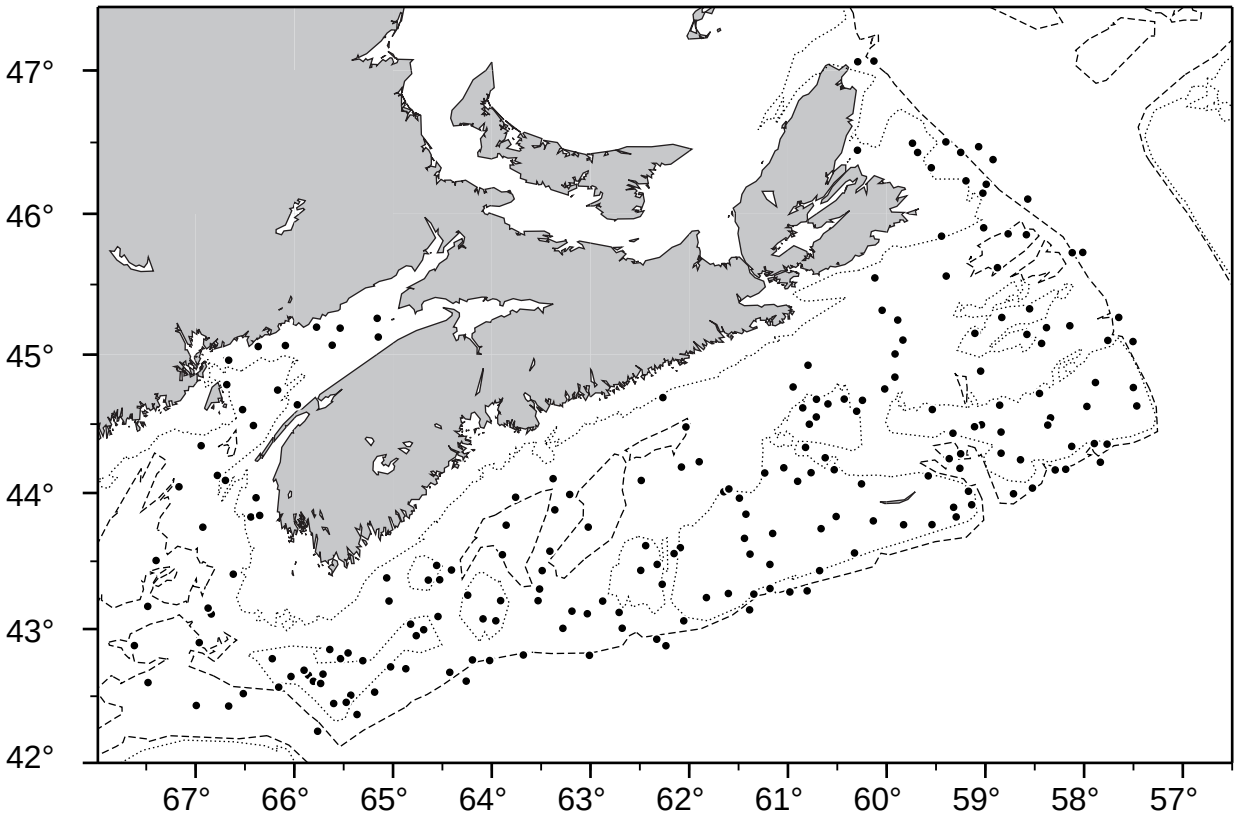

Fig. 2. SUMMER Groundfish Survey Positions 2002

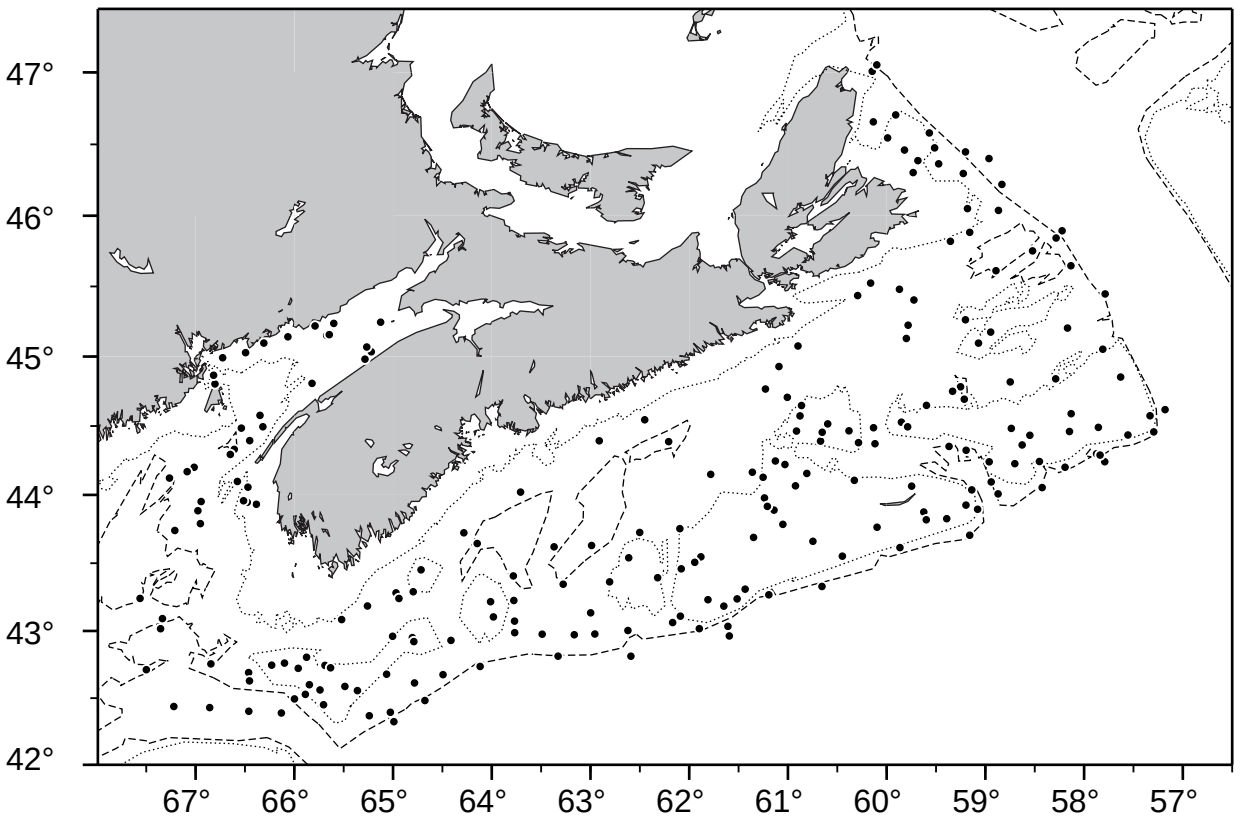

Fig. 3. SUMMER Groundfish Survey Positions 2003

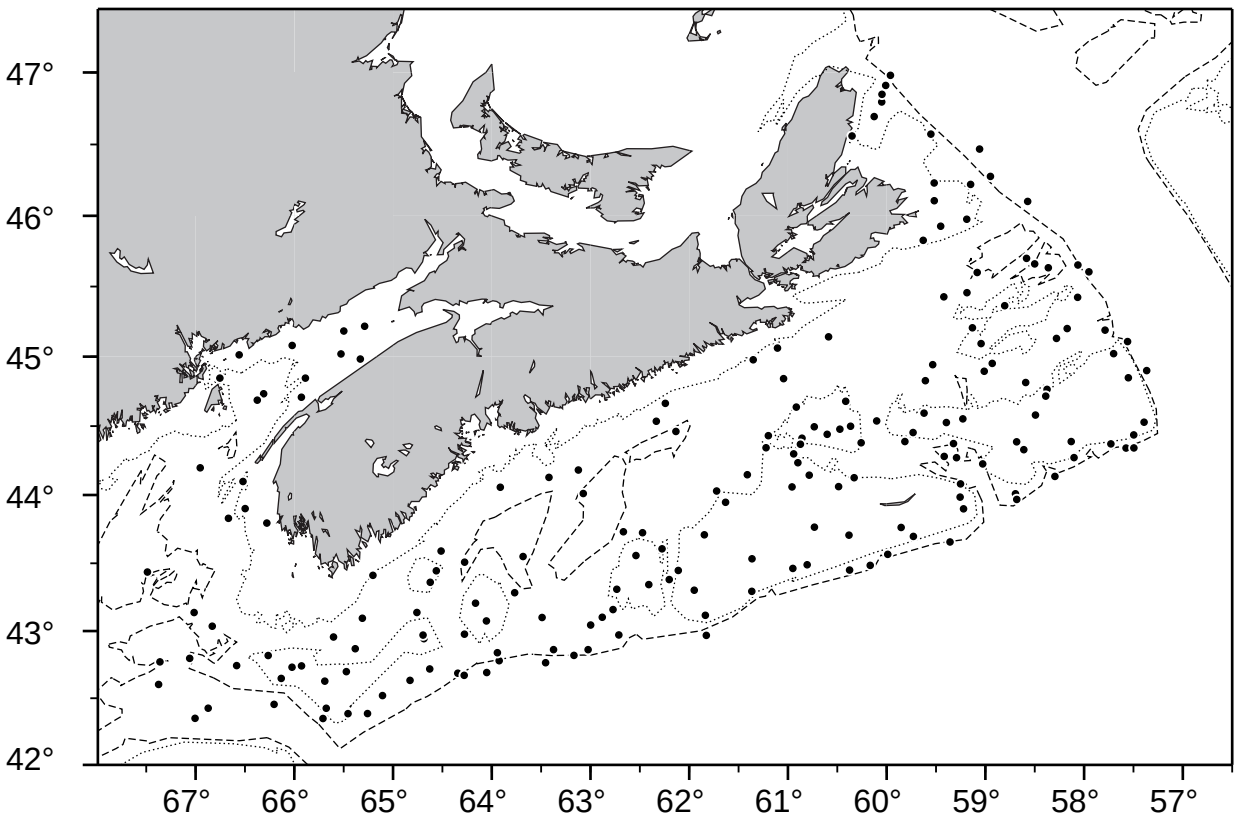

Fig. 4. SUMMER Groundfish Survey Positions 2004

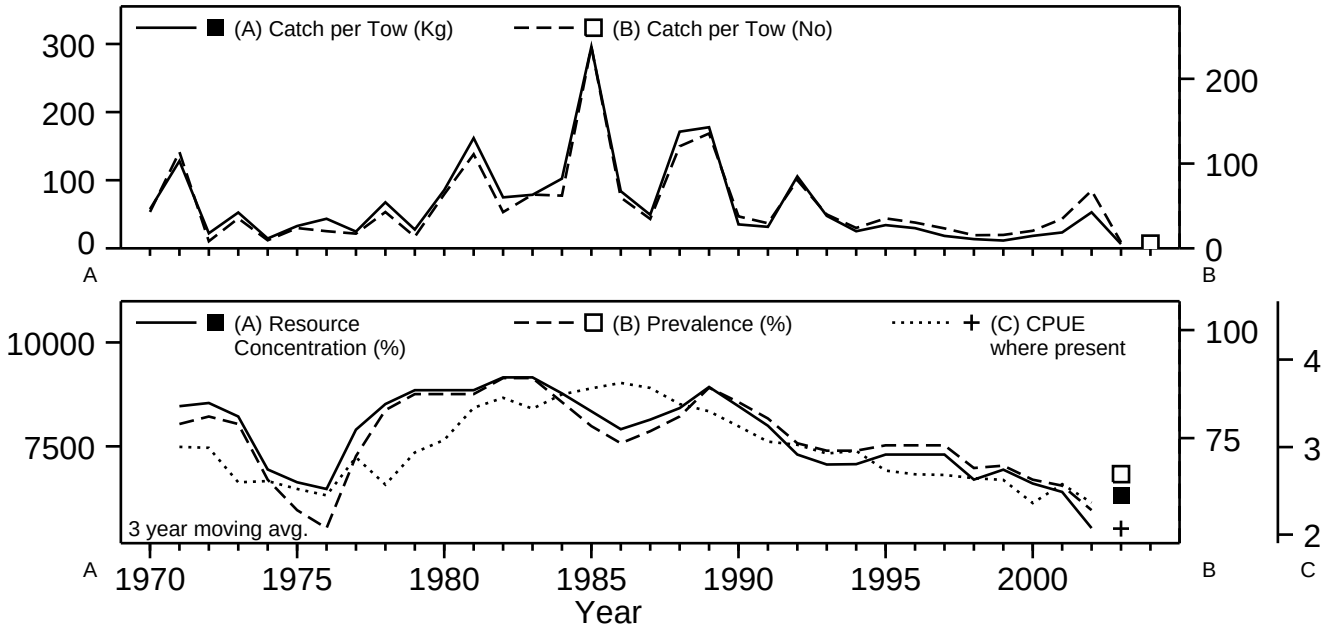

Fig. 5. 4Vn Cod stratified mean weight caught per tow, stratified mean number caught per tow, resource concentration, prevalence, CPUE where present (log number/tow) from the SUMMER Groundfish surveys. The catch for 2004 was sampled using the MV Teleost. It has not been calibrated, and should not be compared to the earlier time series.

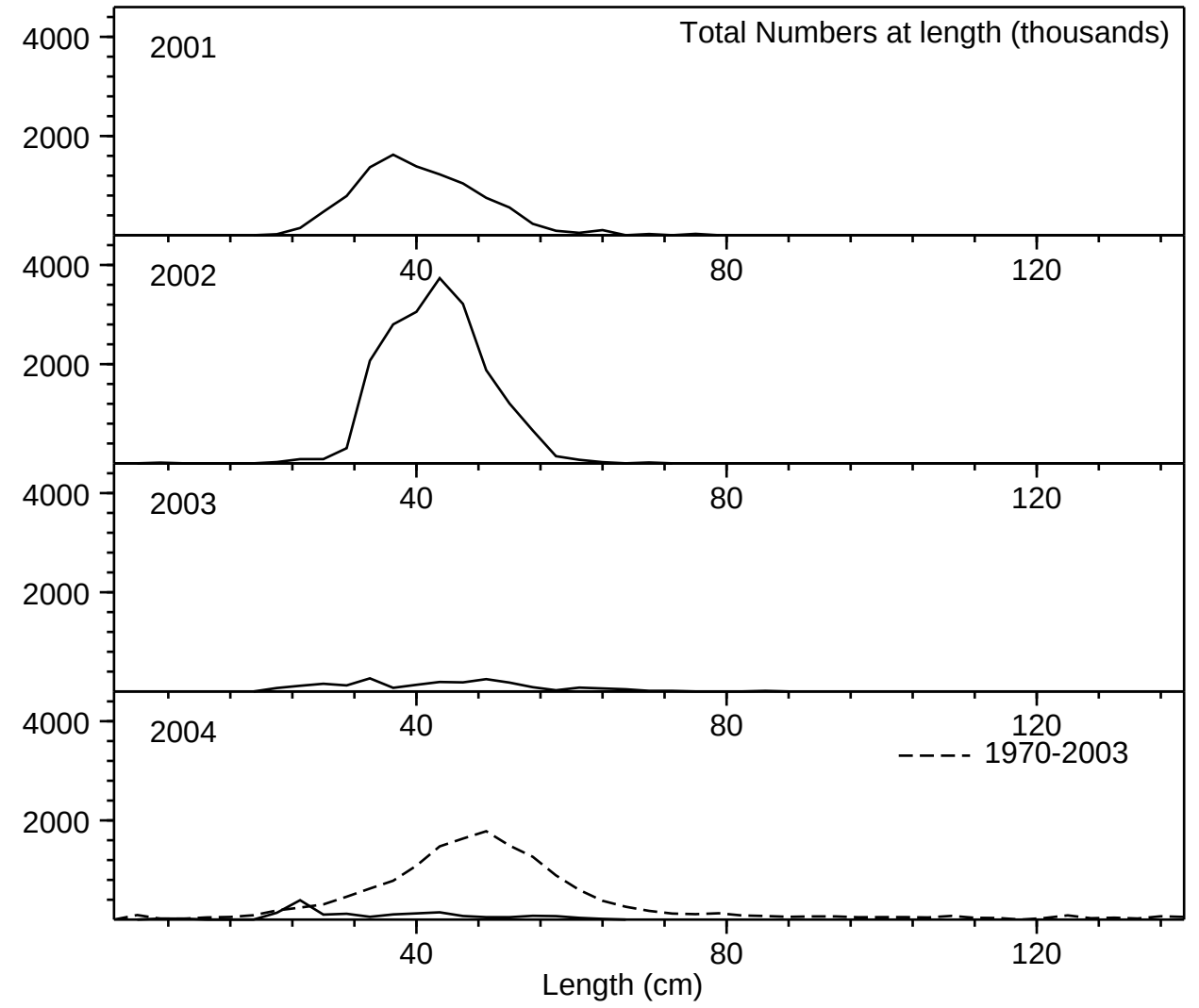

Fig. 6. 4Vn Cod length frequency distribution from the SUMMER Groundfish surveys.

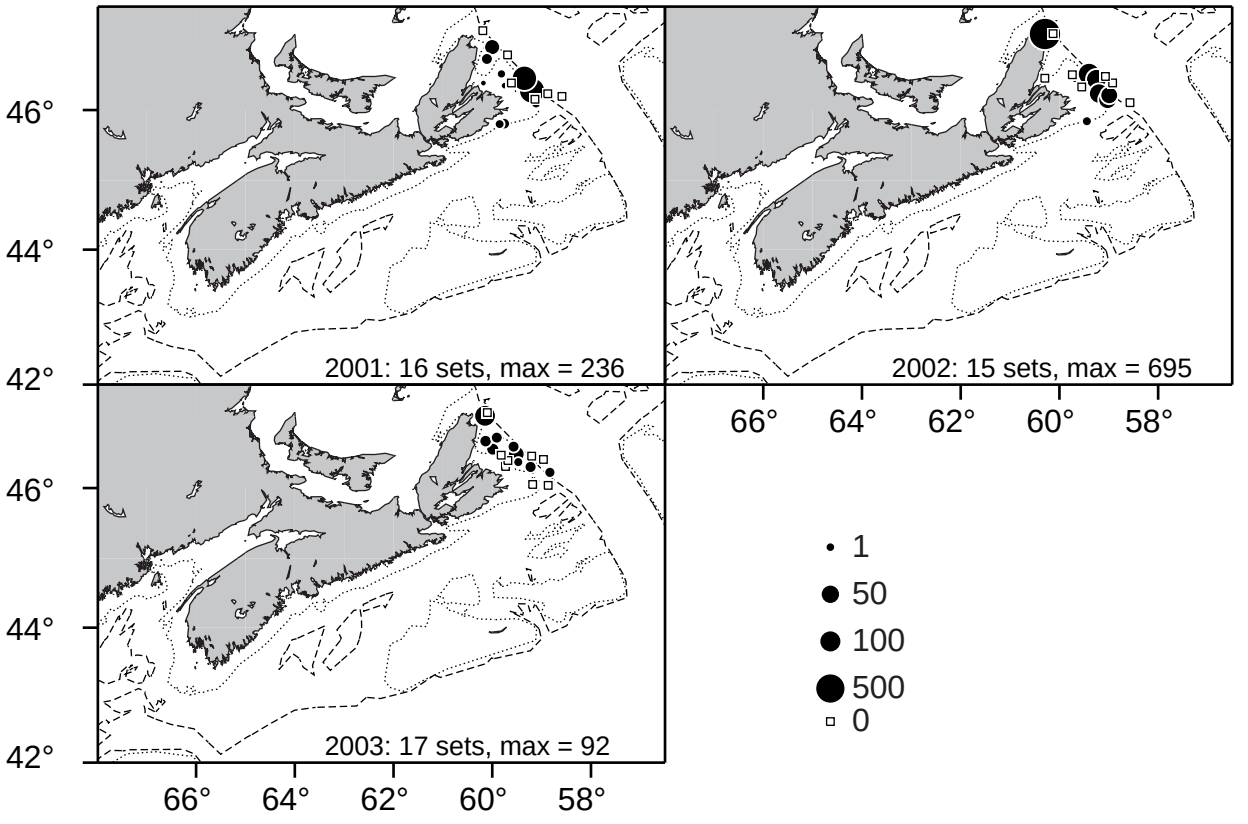

Fig. 7. 4Vn Cod Biomass (kg/tow) from the 2001-2003 SUMMER Groundfish Surveys.

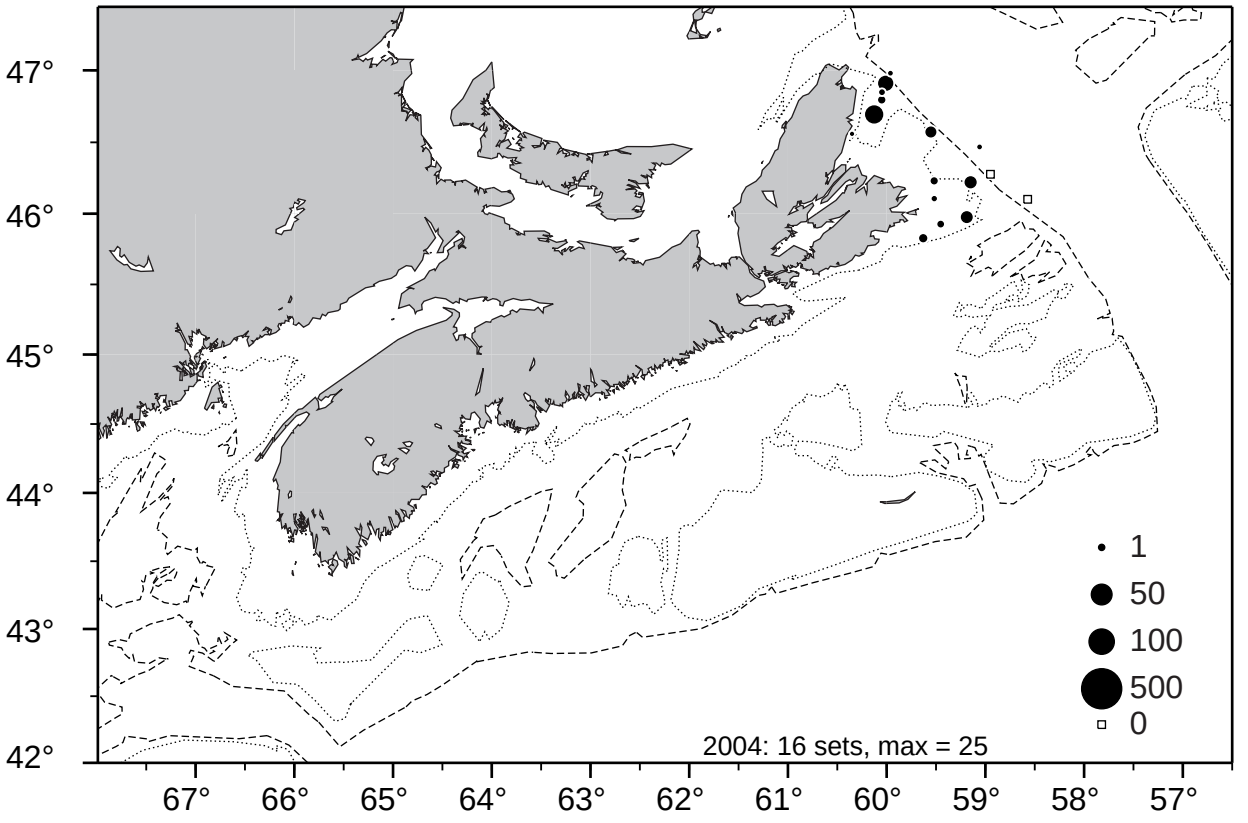

Fig. 8. 4Vn Cod Biomass (kg/tow) from the 2004 SUMMER Groundfish Survey.

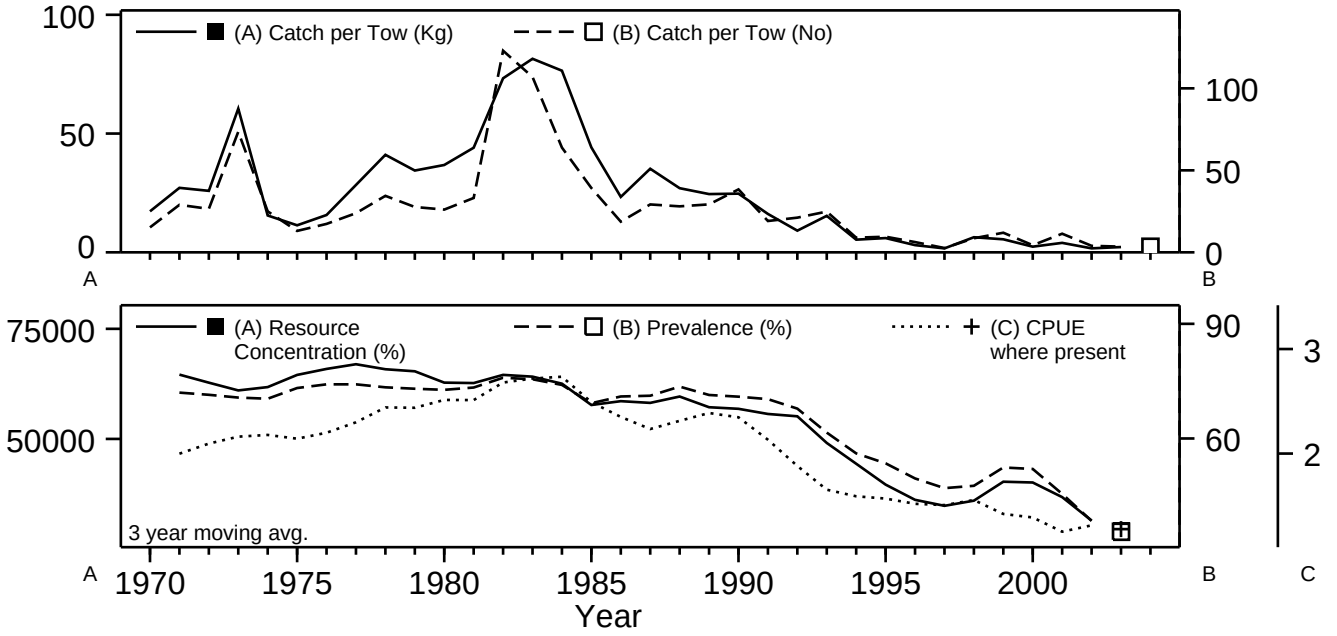

Fig. 9. 4VsW Cod stratified mean weight caught per tow, stratified mean number caught per tow, resource concentration, prevalence, CPUE where present (log number/tow) from the SUMMER Groundfish surveys. The catch for 2004 was sampled using the MV Teleost. It has not been calibrated, and should not be compared to the earlier time series.

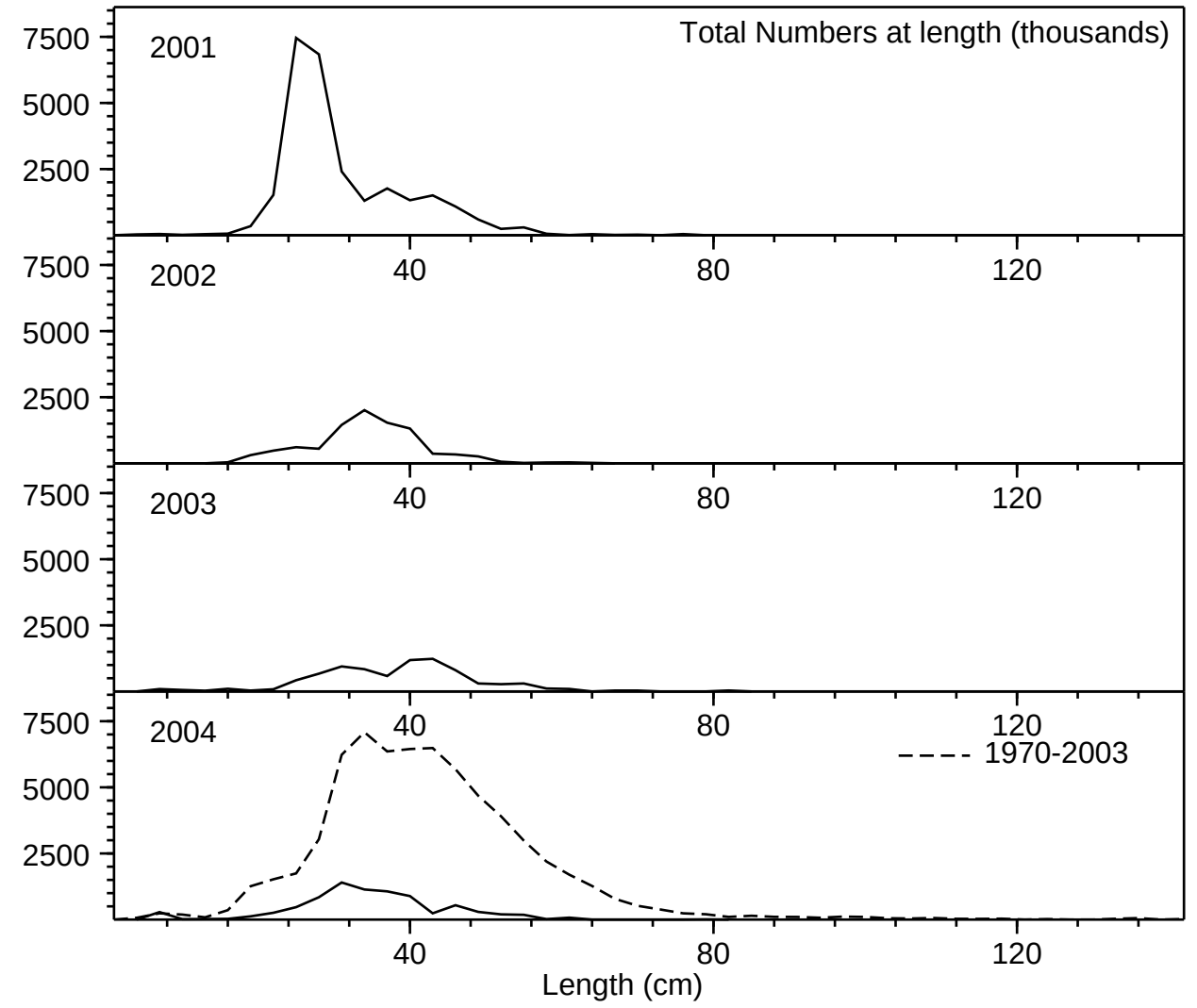

Fig. 10. 4VsW Cod length frequency distribution from the SUMMER Groundfish surveys.

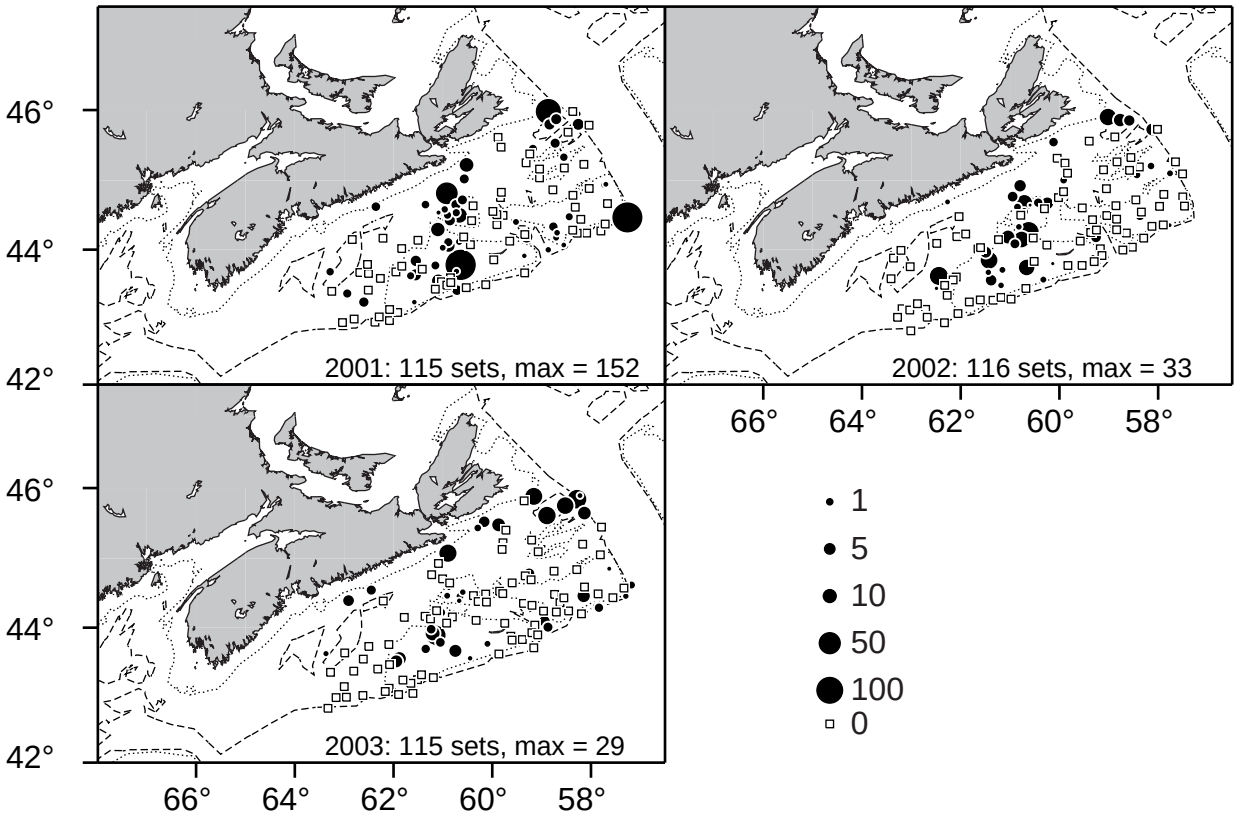

Fig. 11. 4VsW Cod Biomass (kg/tow) from the 2001-2003 SUMMER Groundfish Surveys.

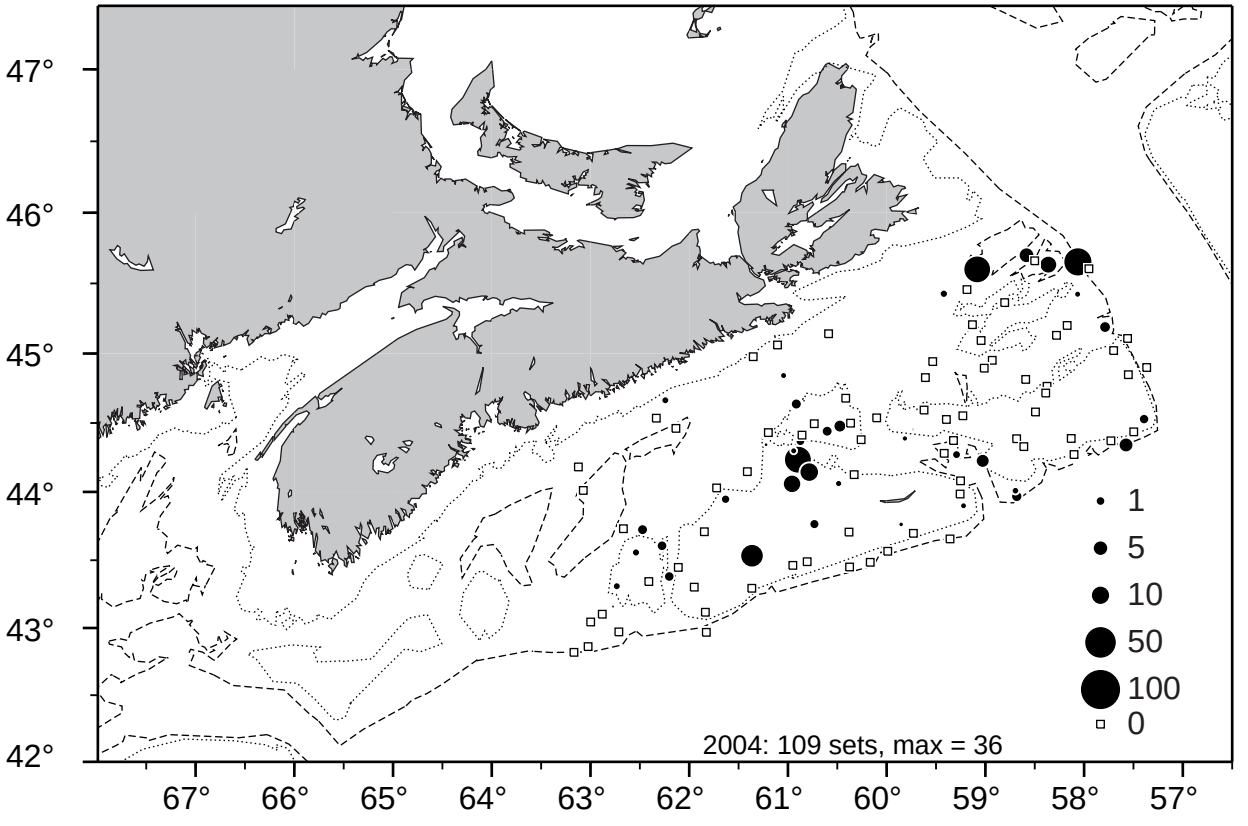

Fig. 12. 4VsW Cod Biomass (kg/tow) from the 2004 SUMMER Groundfish Survey.

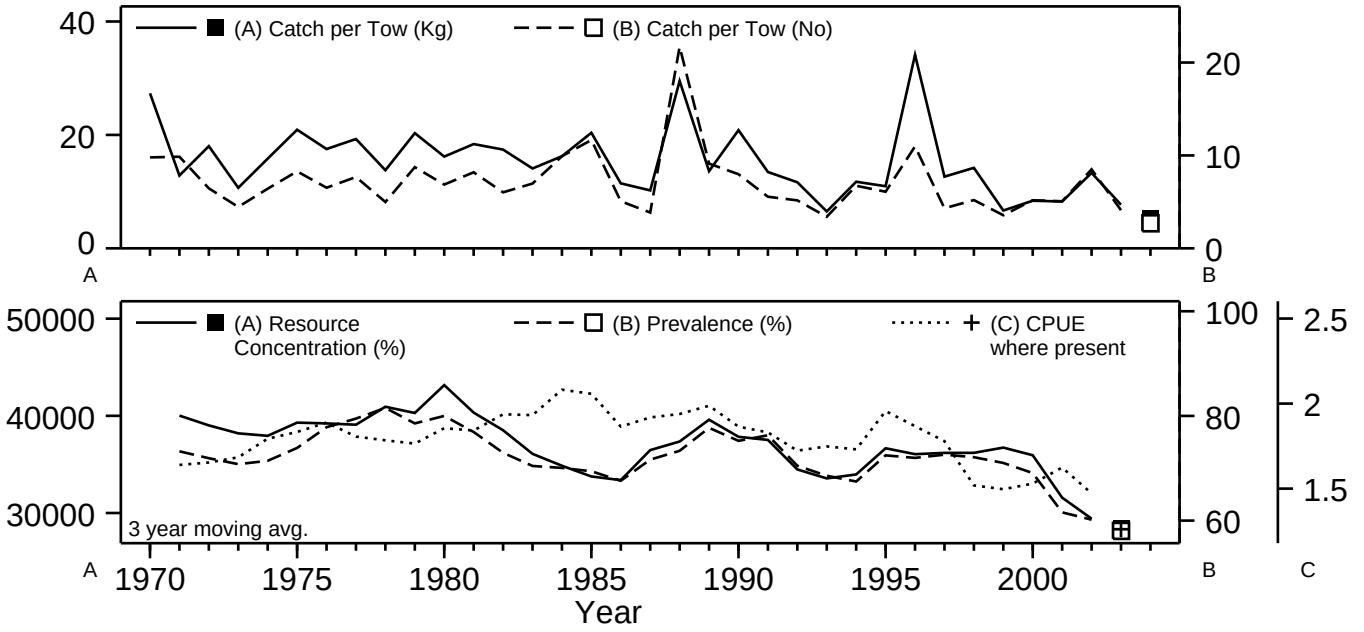

Fig. 13. 4X Cod stratified mean weight caught per tow, stratified mean number caught per tow, resource concentration, prevalence, CPUE where present (log number/tow) from the SUMMER Groundfish surveys. The catch for 2004 was sampled using the MV Teleost. It has not been calibrated, and should not be compared to the earlier time series.

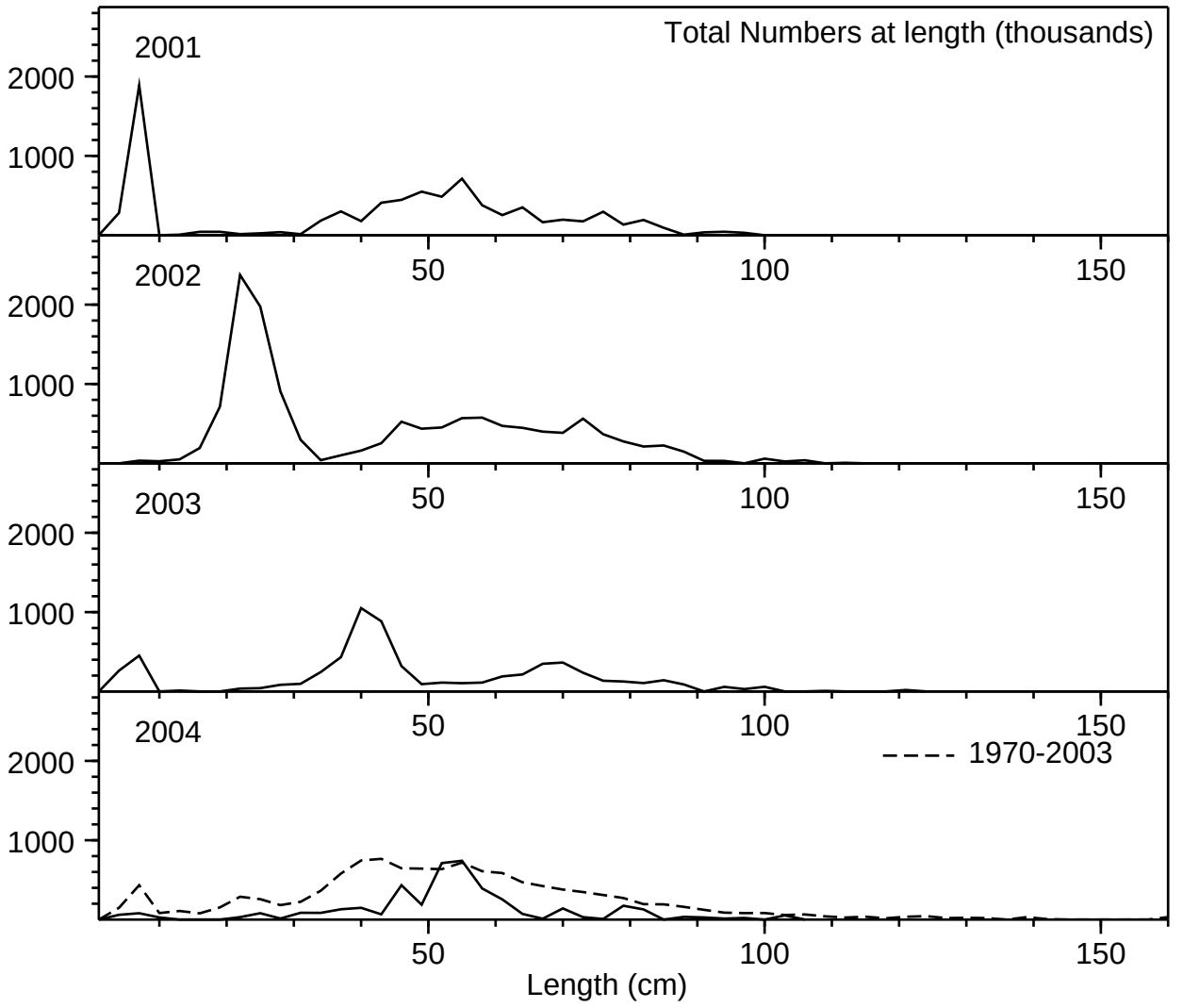

Fig. 14. 4X Cod length frequency distribution from the SUMMER Groundfish surveys.

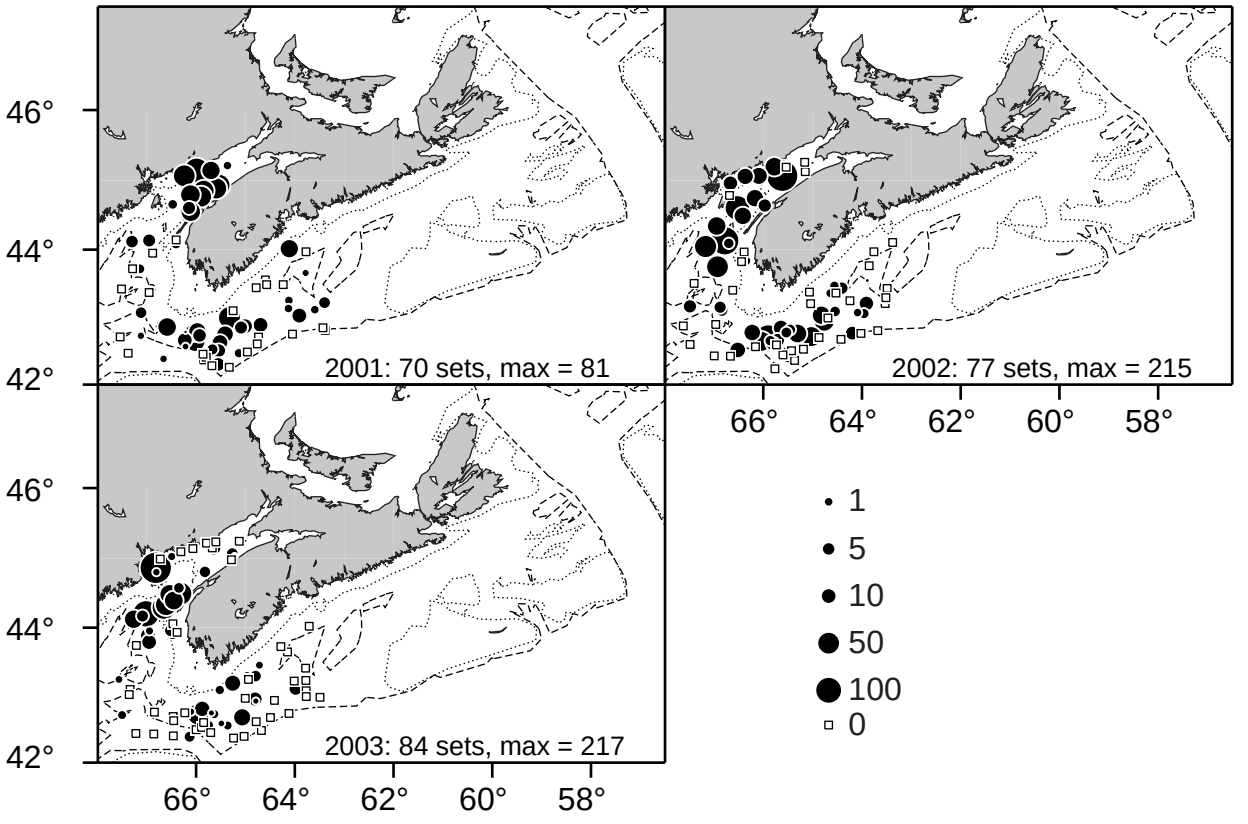

Fig. 15. 4X Cod Biomass (kg/tow) from the 2001-2003 SUMMER Groundfish Surveys.

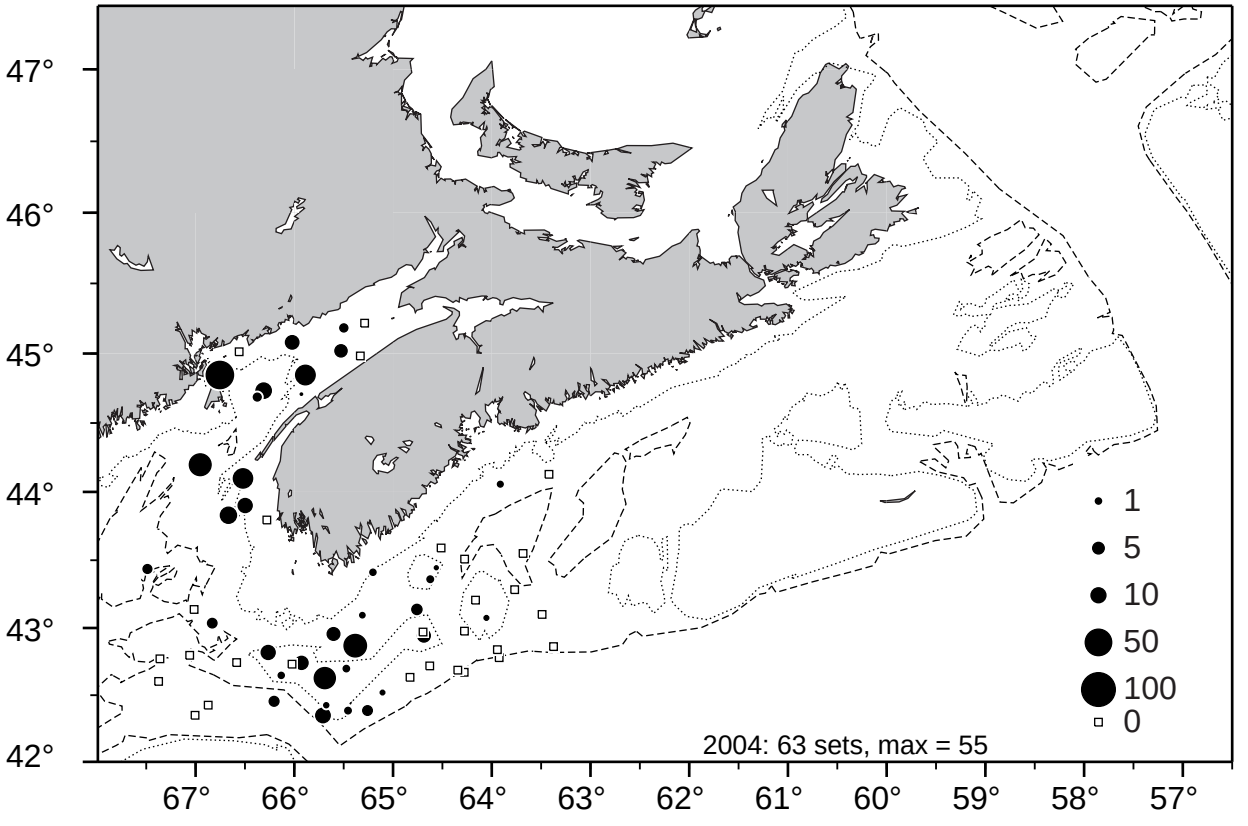

Fig. 16. 4X Cod Biomass (kg/tow) from the 2004 SUMMER Groundfish Survey.

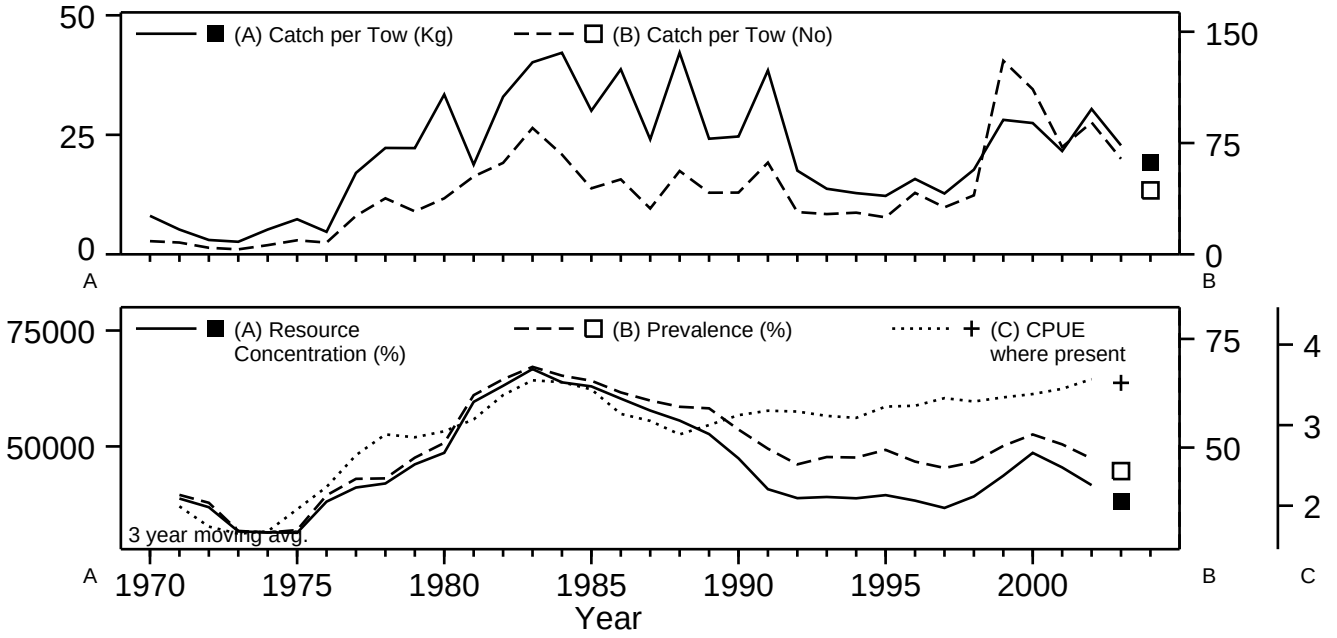

Fig. 17. 4VW Haddock stratified mean weight caught per tow, stratified mean number caught per tow, resource concentration, prevalence, CPUE where present (log number/tow) from the SUMMER Groundfish surveys. The catch for 2004 was sampled using the MV Teleost. It has not been calibrated, and should not be compared to the earlier time series.

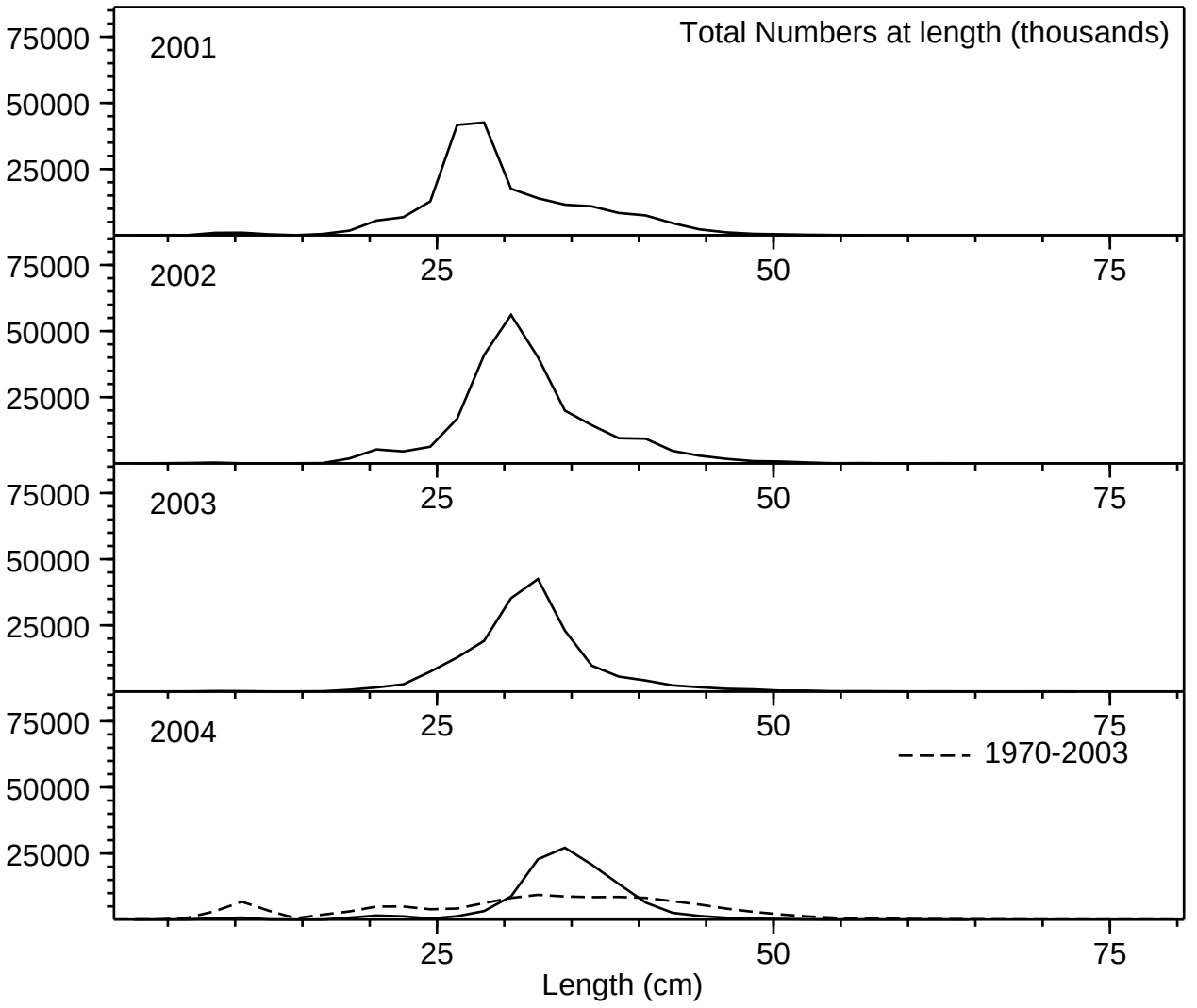

Fig. 18. 4VW Haddock length frequency distribution from the SUMMER Groundfish surveys.

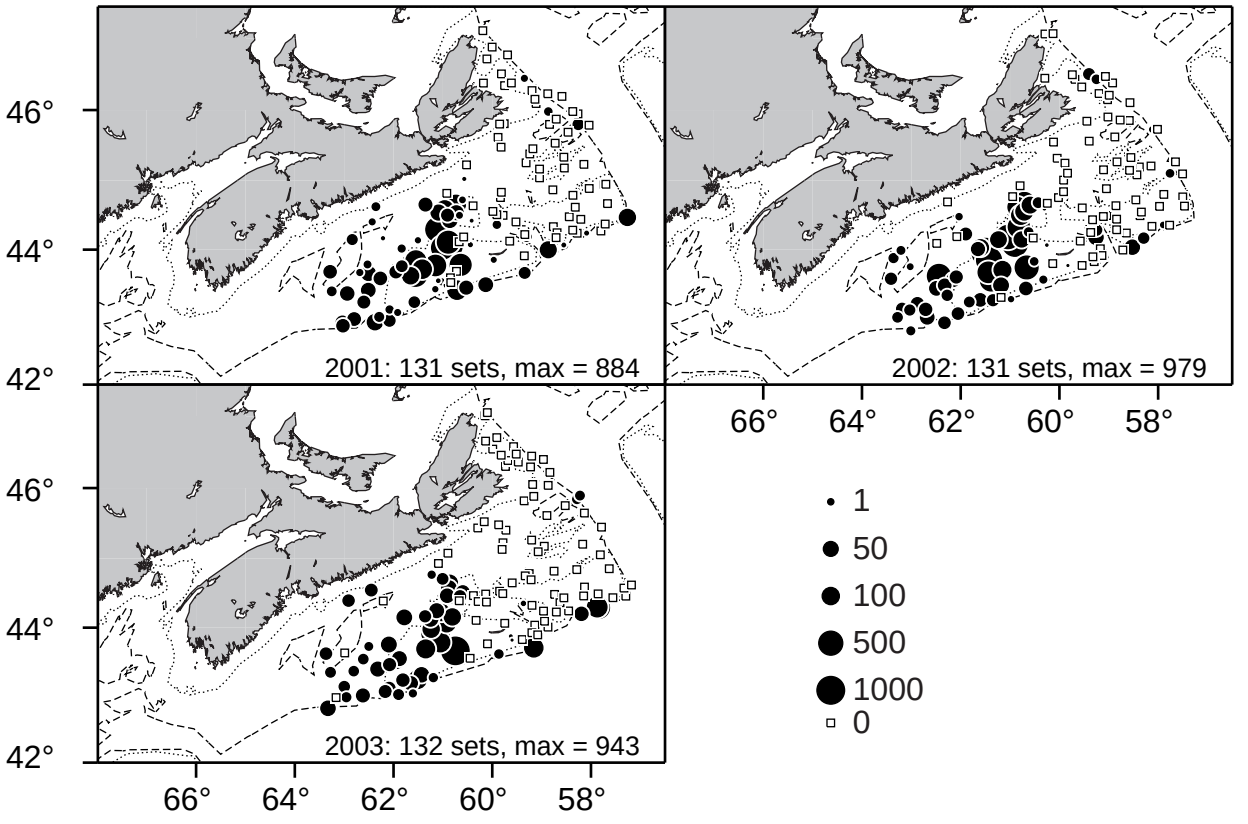

Fig. 19. 4VW Haddock Biomass (kg/tow) from the 2001-2003 SUMMER Groundfish Surveys.

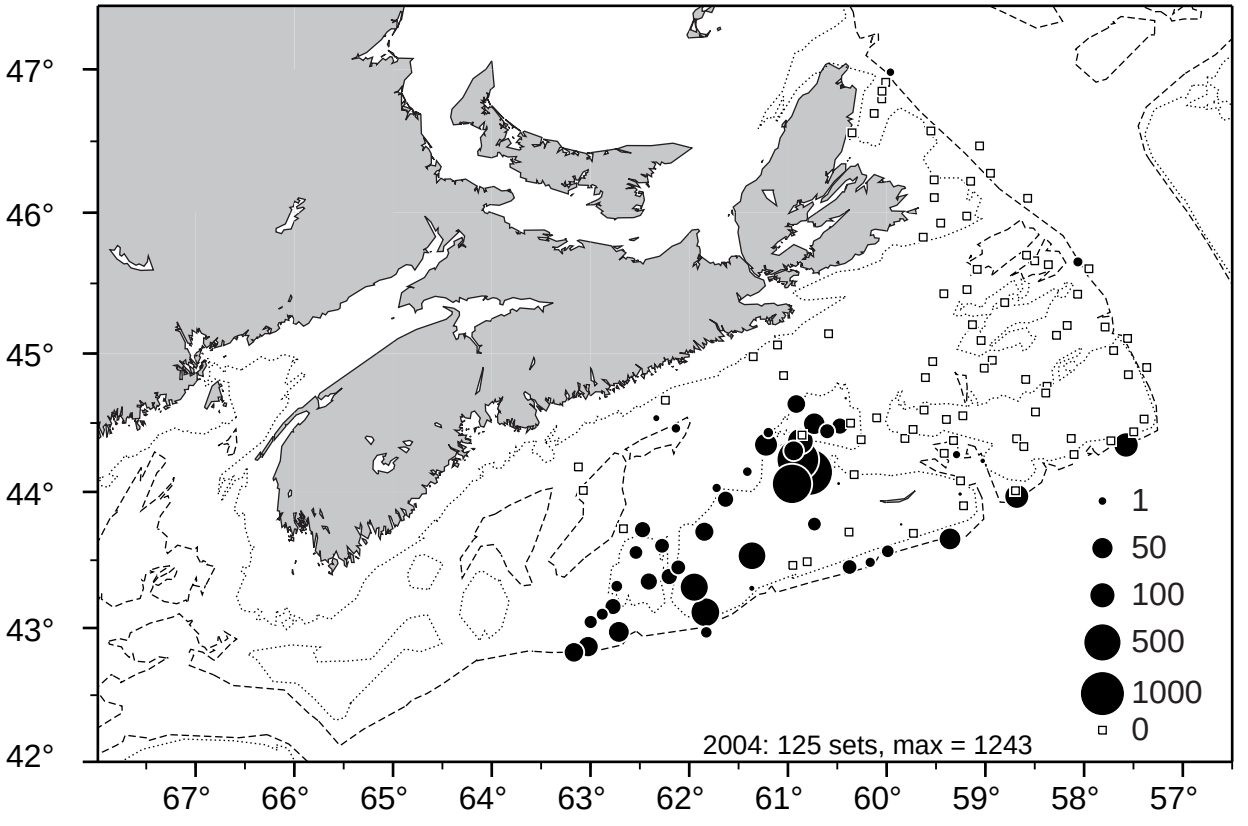

Fig. 20. 4VW Haddock Biomass (kg/tow) from the 2004 SUMMER Groundfish Survey.

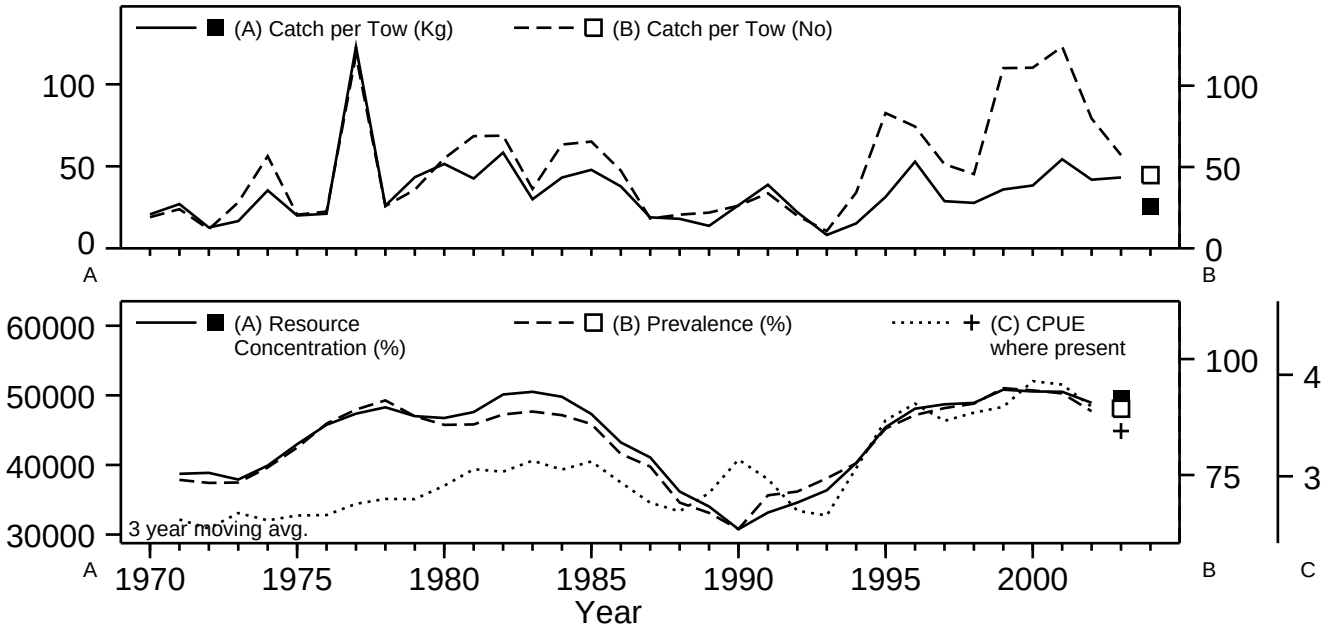

Fig. 21. 4X Haddock stratified mean weight caught per tow, stratified mean number caught per tow, resource concentration, prevalence, CPUE where present (log number/tow) from the SUMMER Groundfish surveys. The catch for 2004 was sampled using the MV Teleost. It has not been calibrated, and should not be compared to the earlier time series.

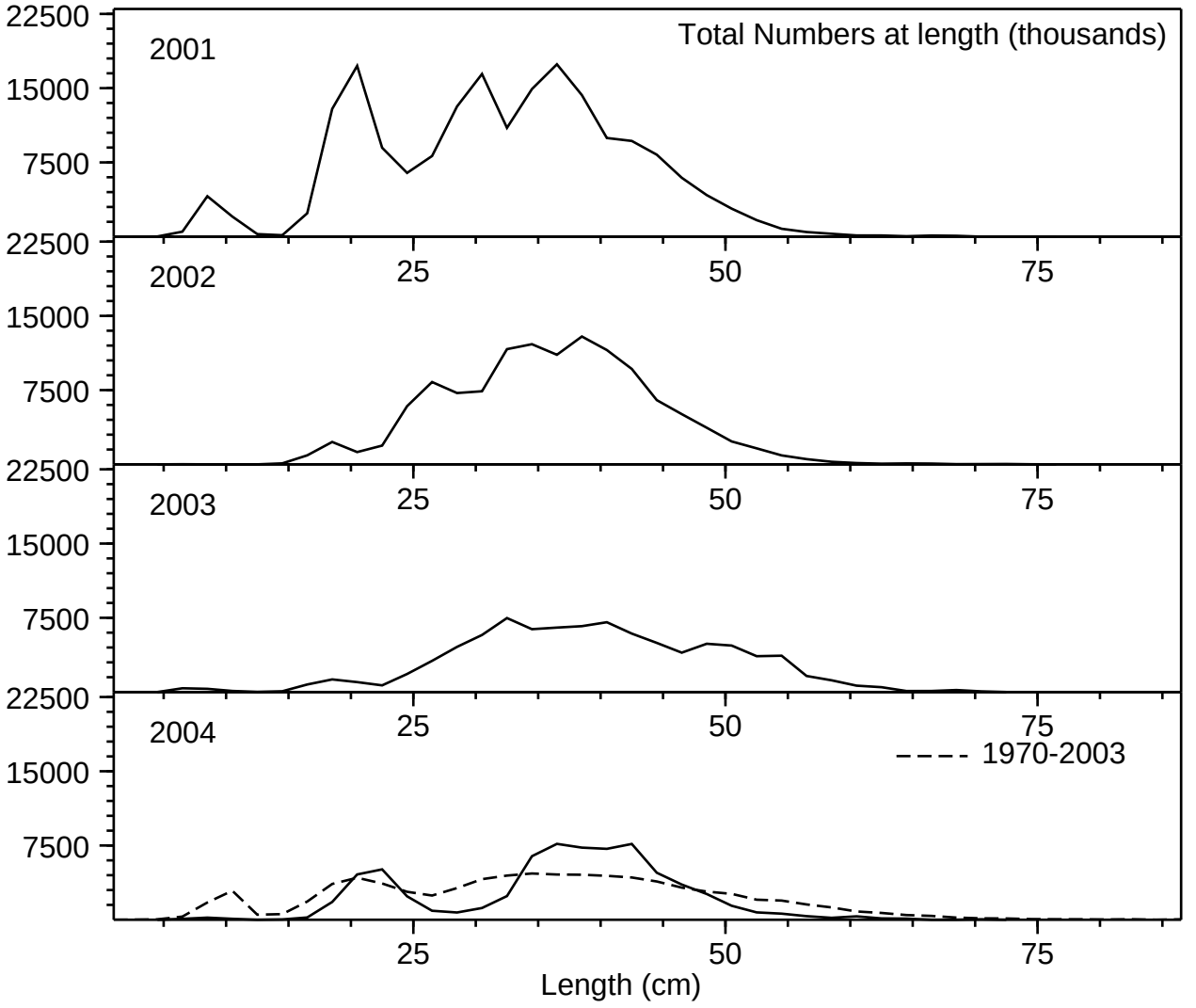

Fig. 22. 4X Haddock length frequency distribution from the SUMMER Groundfish surveys.

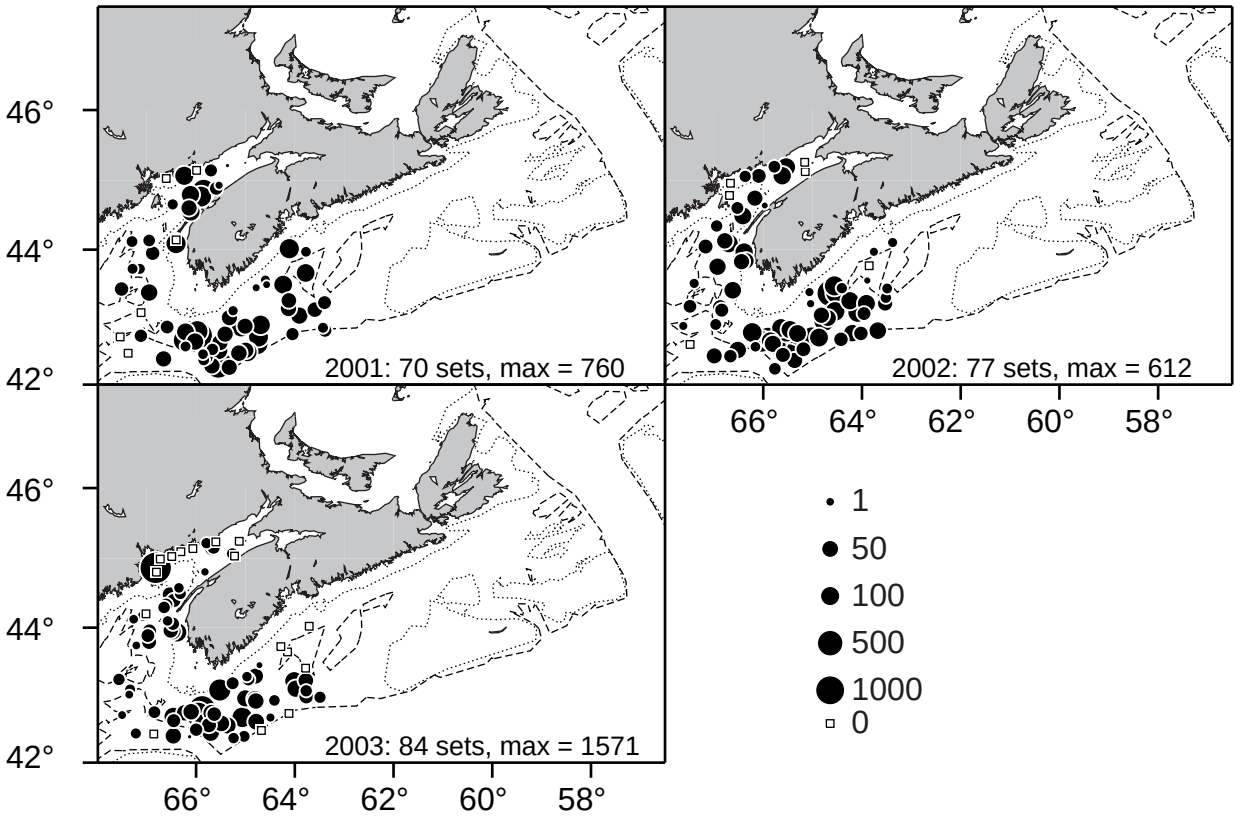

Fig. 23. 4X Haddock Biomass (kg/tow) from the 2001-2003 SUMMER Groundfish Surveys.

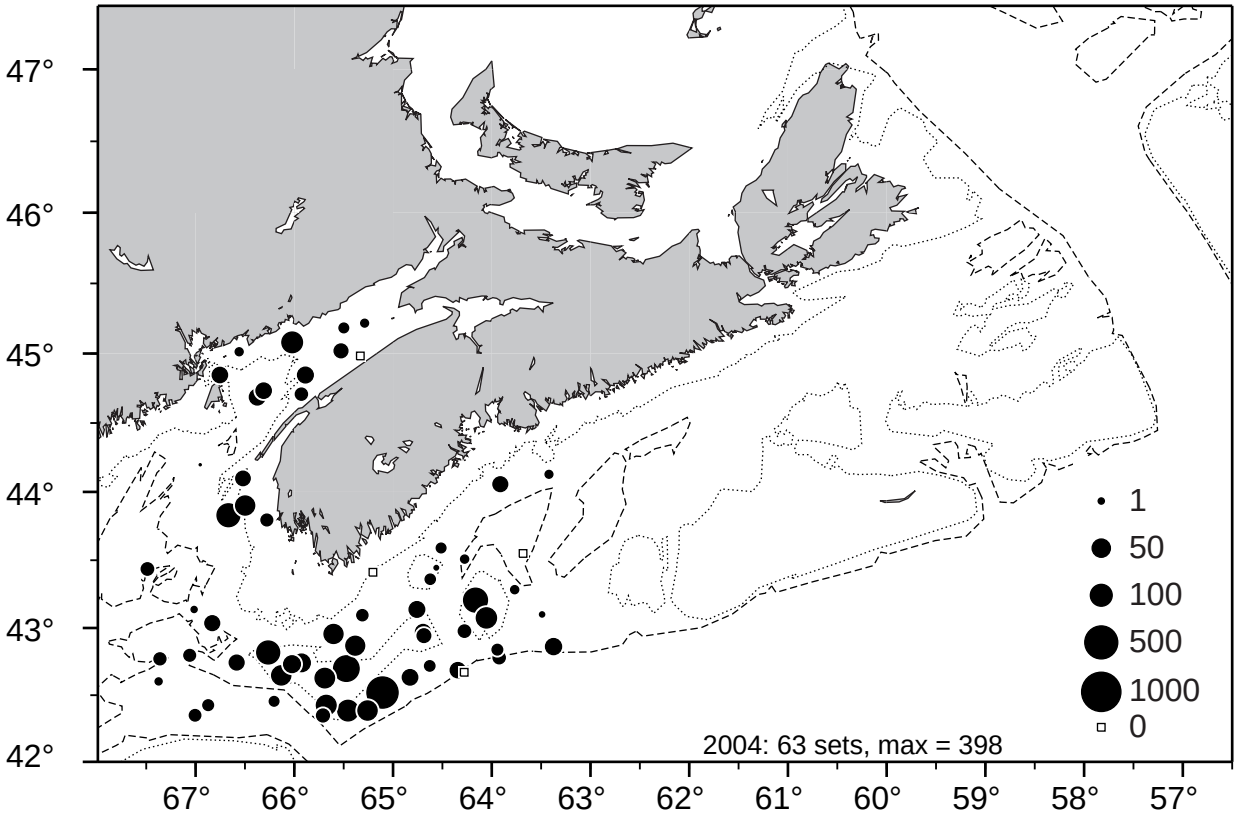

Fig. 24. 4X Haddock Biomass (kg/tow) from the 2004 SUMMER Groundfish Survey.

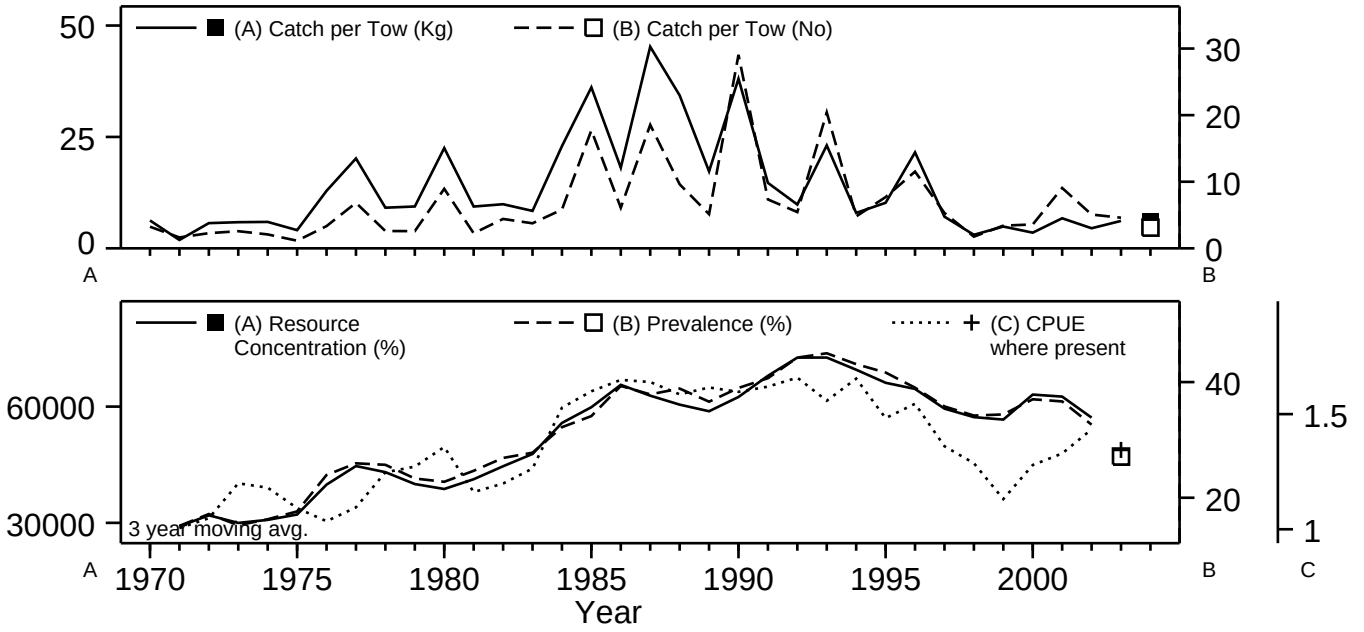

Fig. 25. 4VWX Pollock stratified mean weight caught per tow, stratified mean number caught per tow, resource concentration, prevalence, CPUE where present (log number/tow) from the SUMMER Groundfish surveys. The catch for 2004 was sampled using the MV Teleost. It has not been calibrated, and should not be compared to the earlier time series.

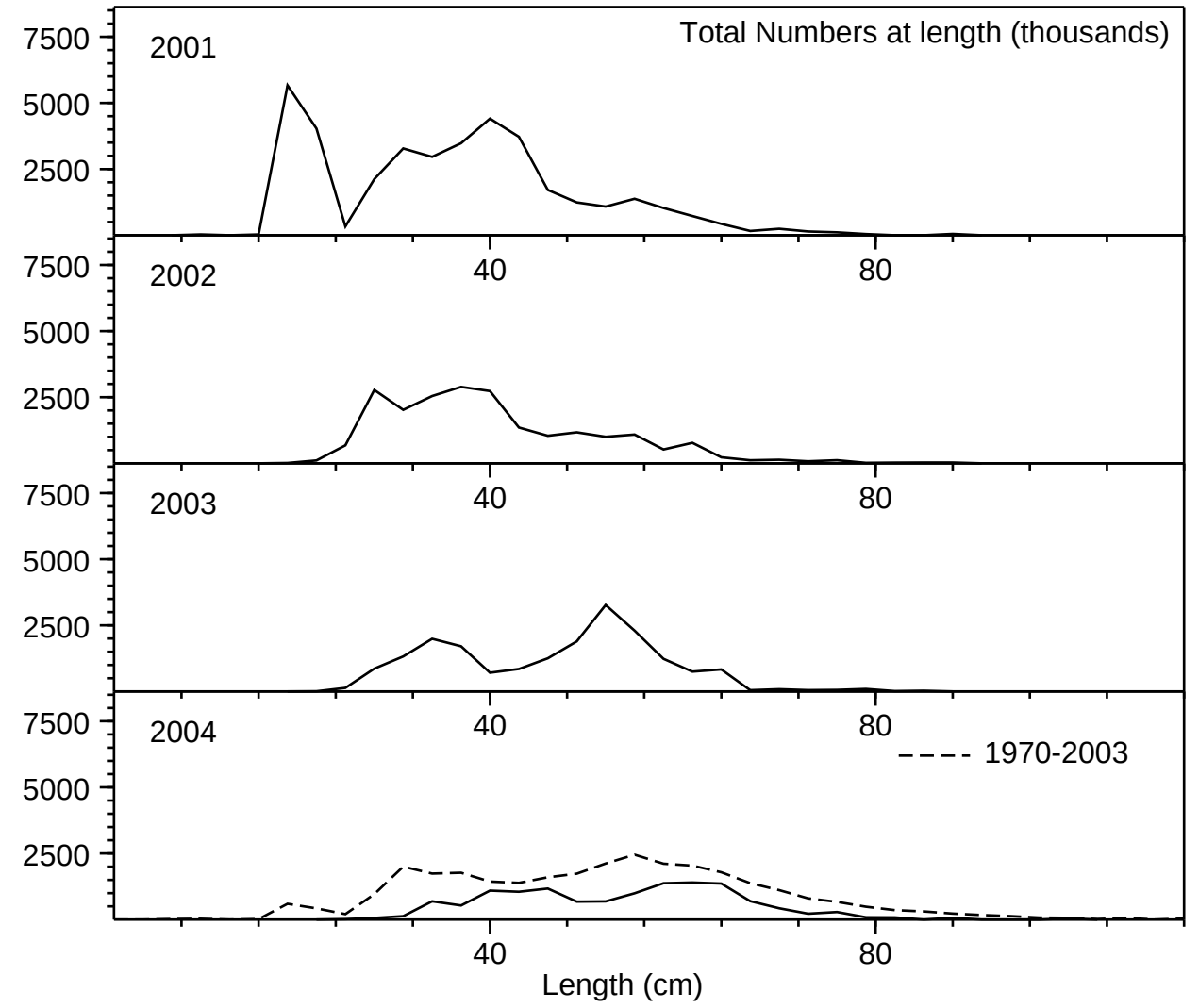

Fig. 26. 4VWX Pollock length frequency distribution from the SUMMER Groundfish surveys.

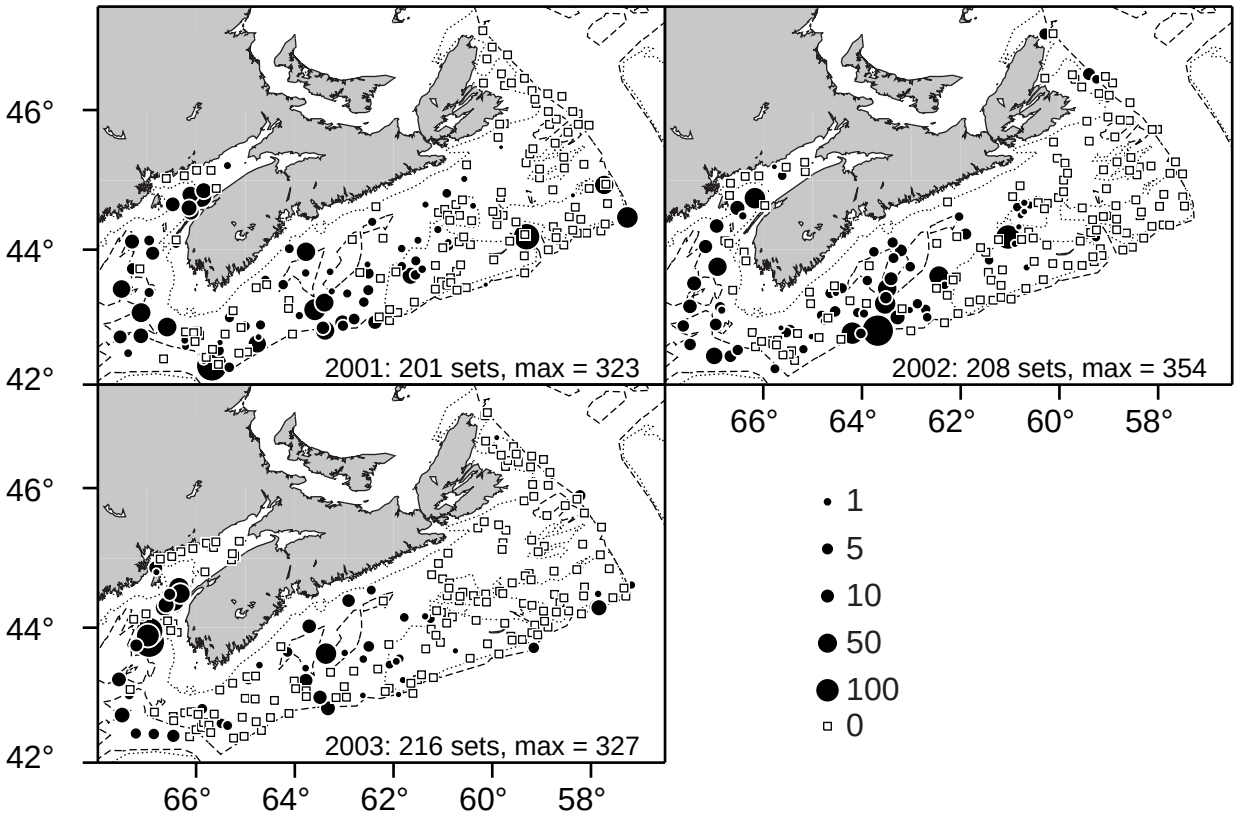

Fig. 27. 4VWX Pollock Biomass (kg/tow) from the 2001-2003 SUMMER Groundfish Surveys.

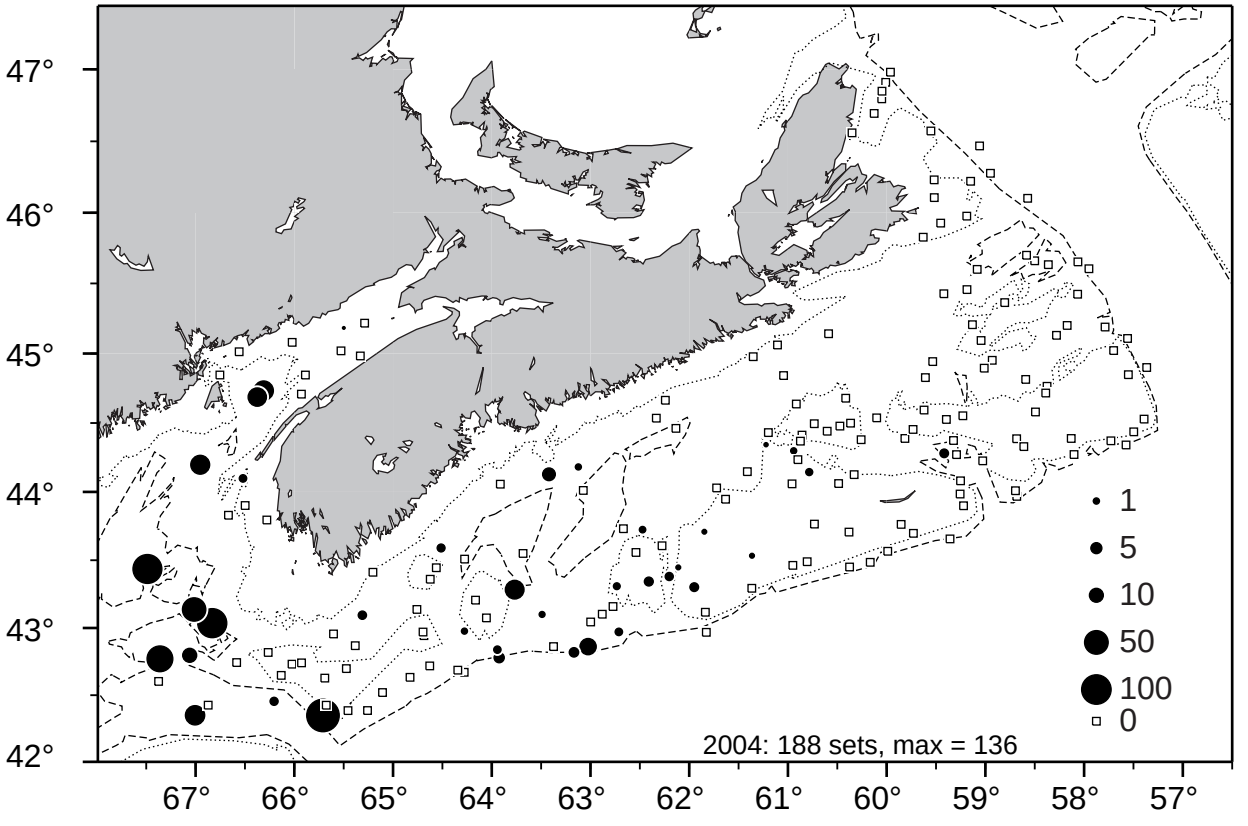

Fig. 28. 4VWX Pollock Biomass (kg/tow) from the 2004 SUMMER Groundfish Survey.

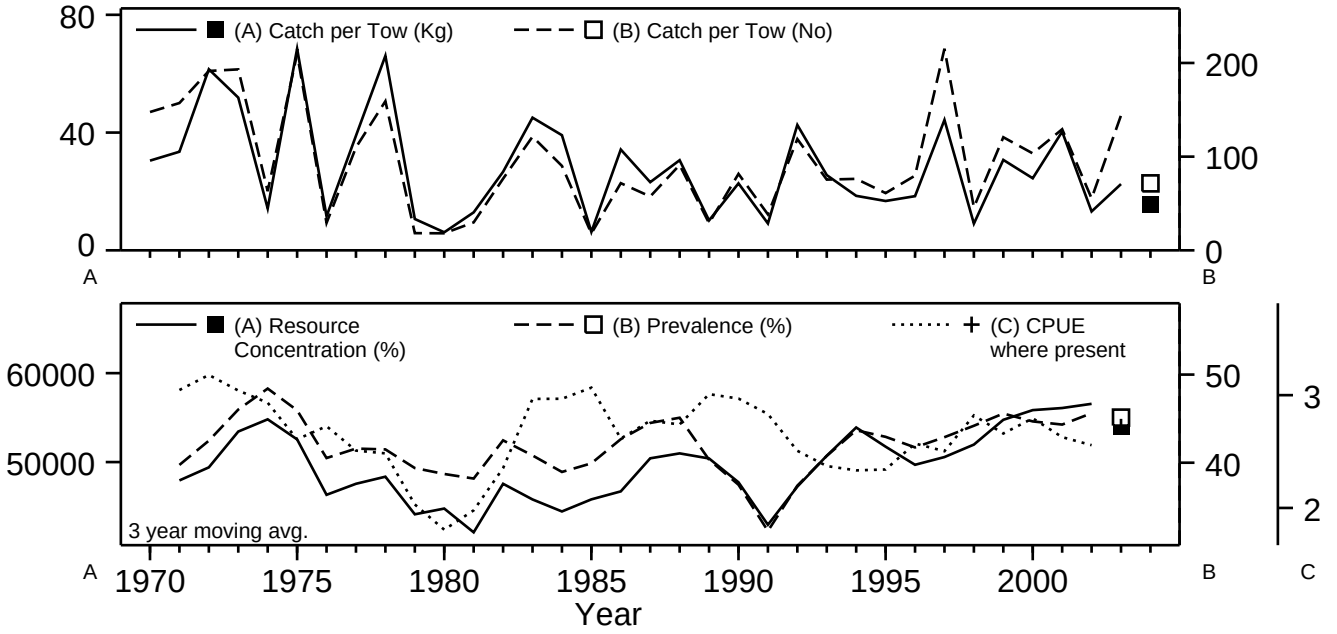

Fig. 29. Unit3 Redfish Unseparated stratified mean weight caught per tow, stratified mean number caught per tow, resource concentration, prevalence, CPUE where present (log number/tow) from the SUMMER Groundfish surveys. The catch for 2004 was sampled using the MV Teleost. It has not been calibrated, and should not be compared to the earlier time series.

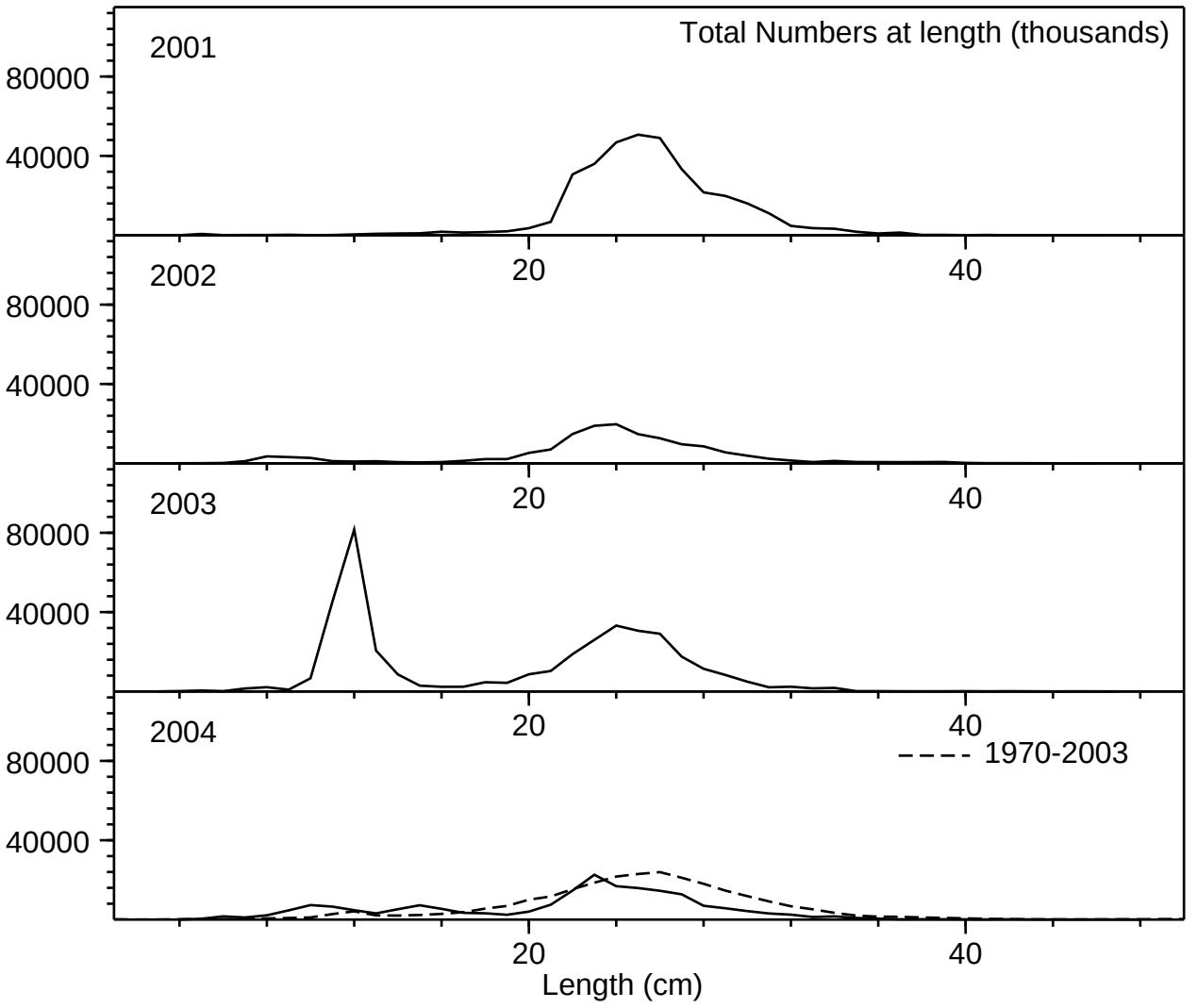

Fig. 30. Unit3 Redfish Unseparated length frequency distribution from the SUMMER Groundfish surveys.

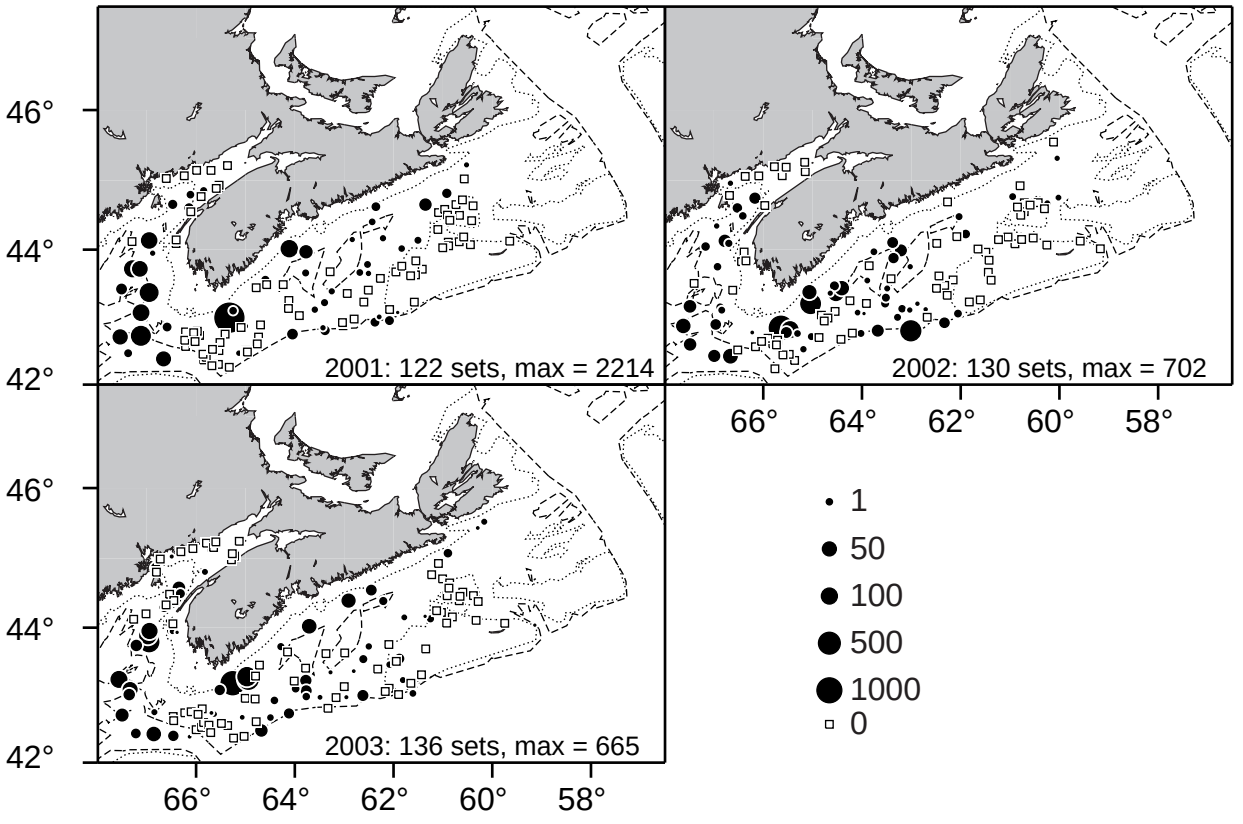

Fig. 31. Unit3 Redfish Unseparated Biomass (kg/tow) from the 2001-2003 SUMMER Groundfish Surveys.

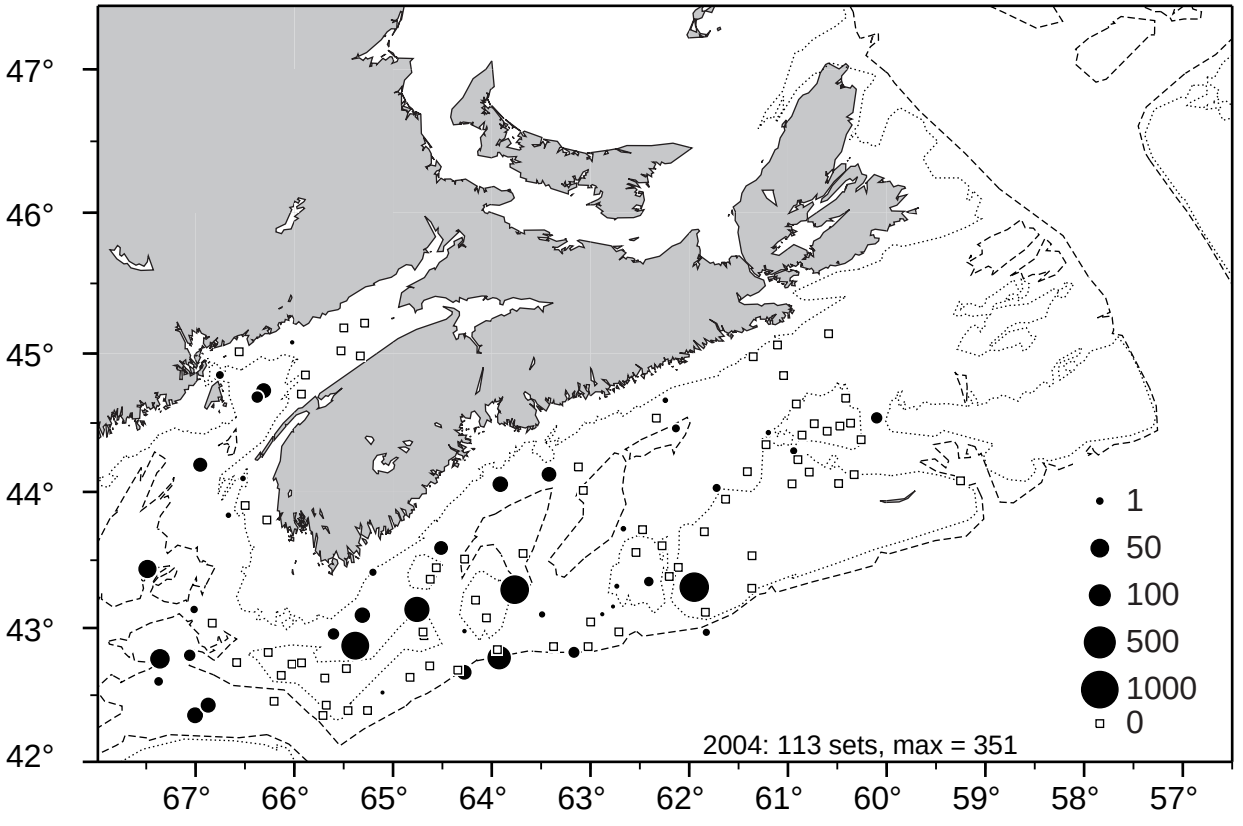

Fig. 32. Unit3 Redfish Unseparated Biomass (kg/tow) from the 2004 SUMMER Groundfish Survey.

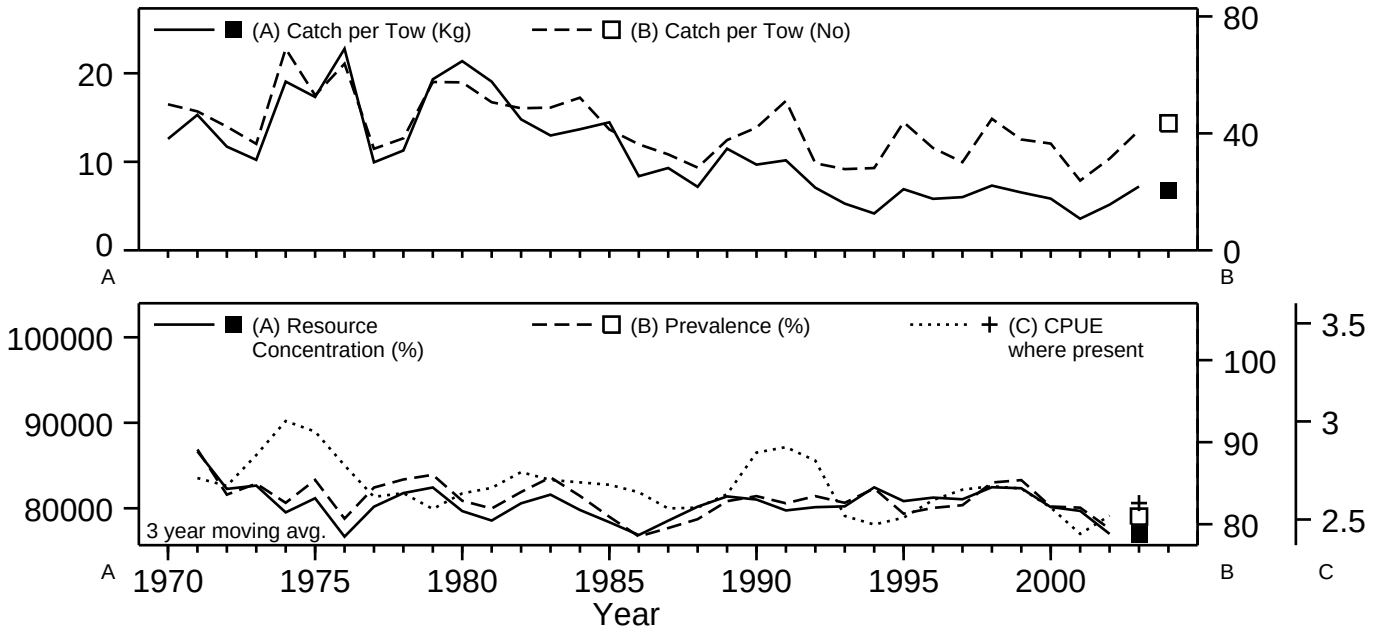

Fig. 33. 4VW American Plaice stratified mean weight caught per tow, stratified mean number caught per tow, resource concentration, prevalence, CPUE where present (log number/tow) from the SUMMER Groundfish surveys. The catch for 2004 was sampled using the MV Teleost. It has not been calibrated, and should not be compared to the earlier time series.

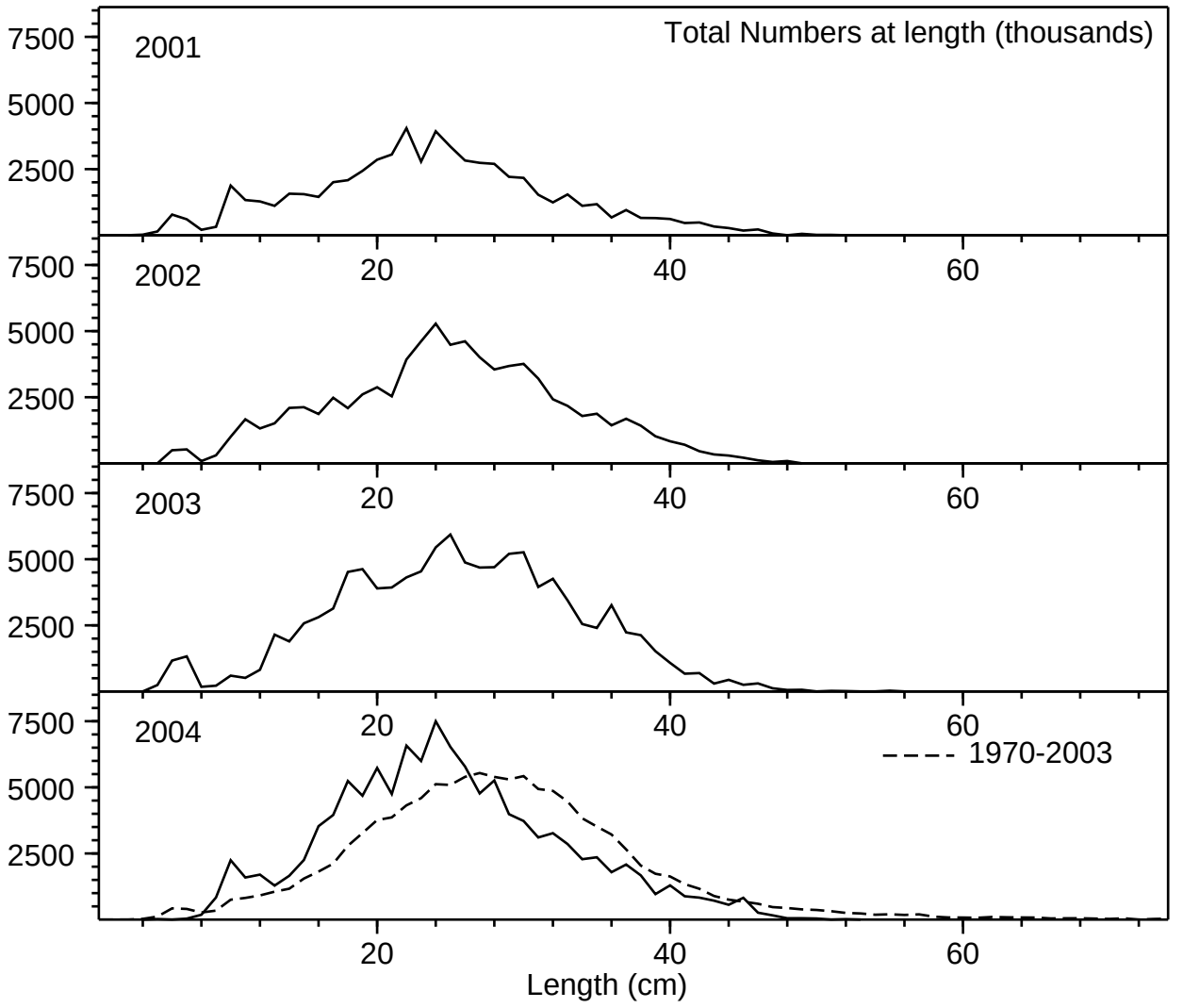

Fig. 34. 4VW American Plaice length frequency distribution from the SUMMER Groundfish surveys.

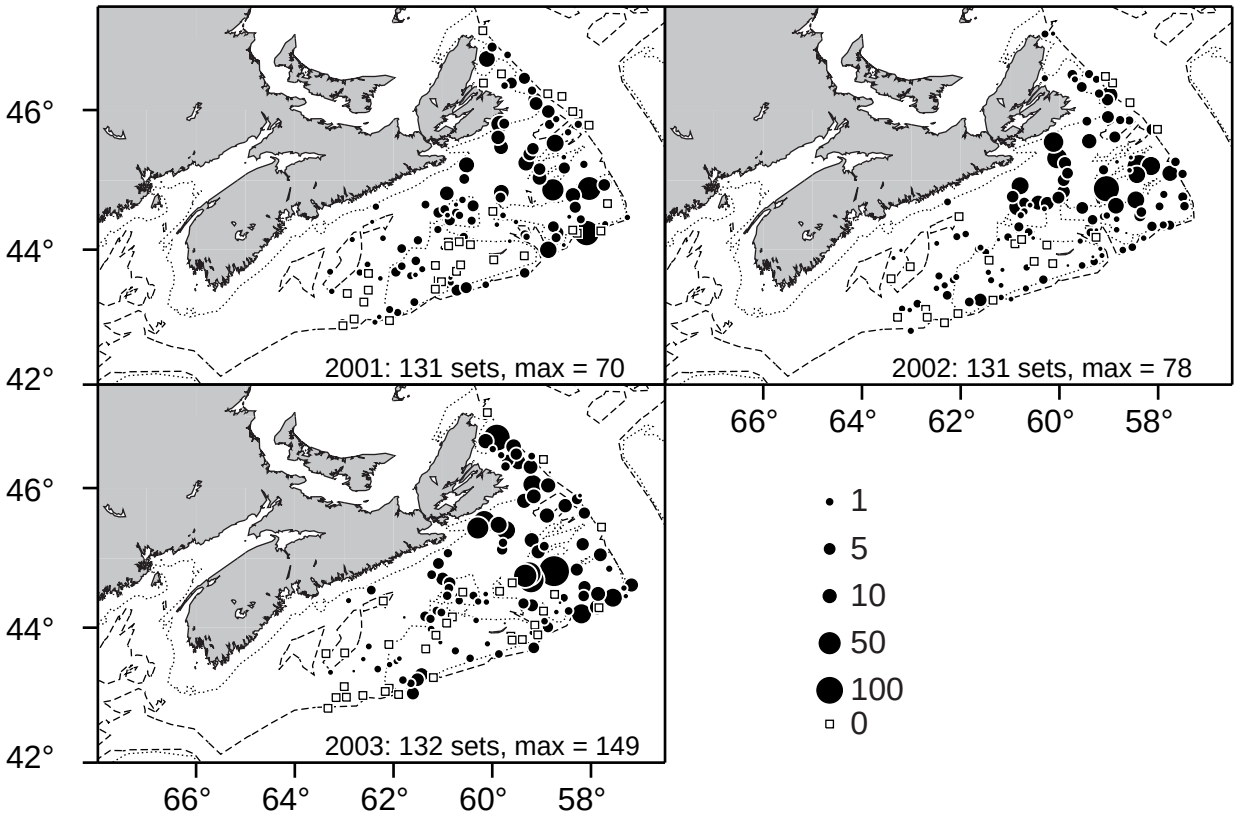

Fig. 35. 4VW American Plaice Biomass (kg/tow) from the 2001-2003 SUMMER Groundfish Surveys.

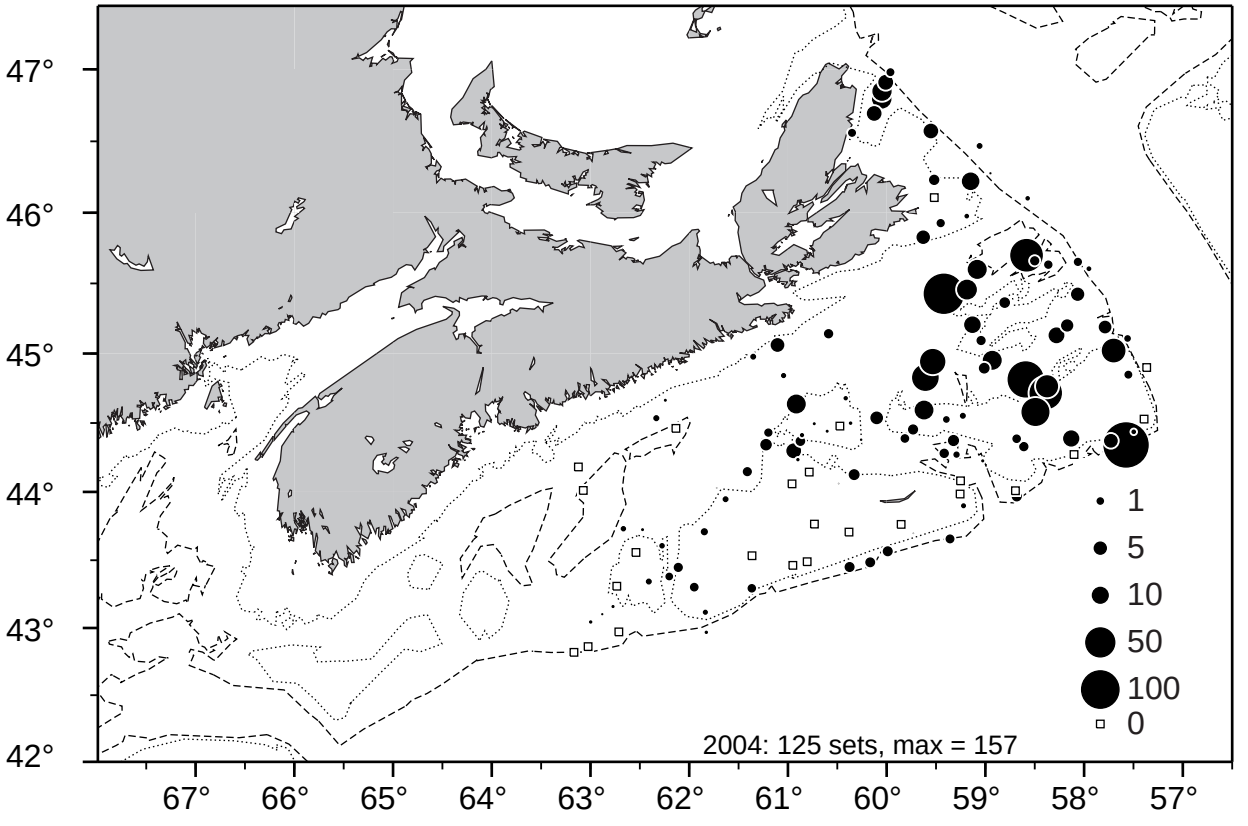

Fig. 36. 4VW American Plaice Biomass (kg/tow) from the 2004 SUMMER Groundfish Survey.

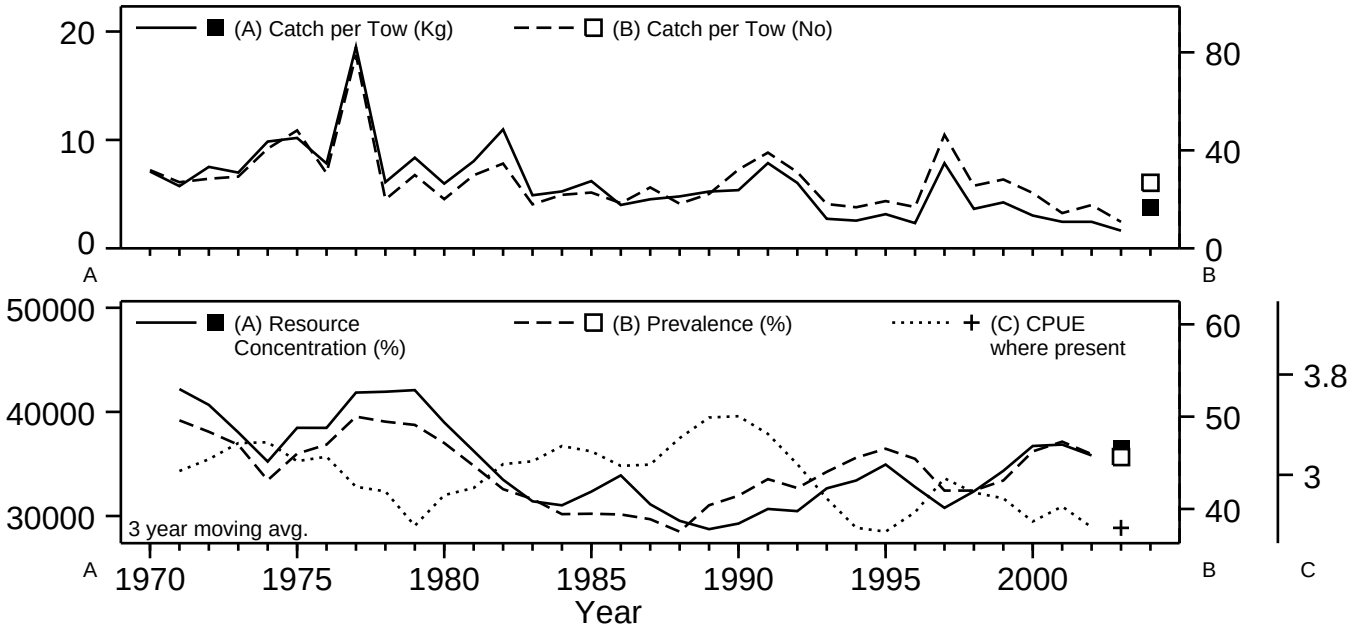

Fig. 37. 4VW Yellowtail Flounder stratified mean weight caught per tow, stratified mean number caught per tow, resource concentration, prevalence, CPUE where present (log number/tow) from the SUMMER Groundfish surveys. The catch for 2004 was sampled using the MV Teleost. It has not been calibrated, and should not be compared to the earlier time series.

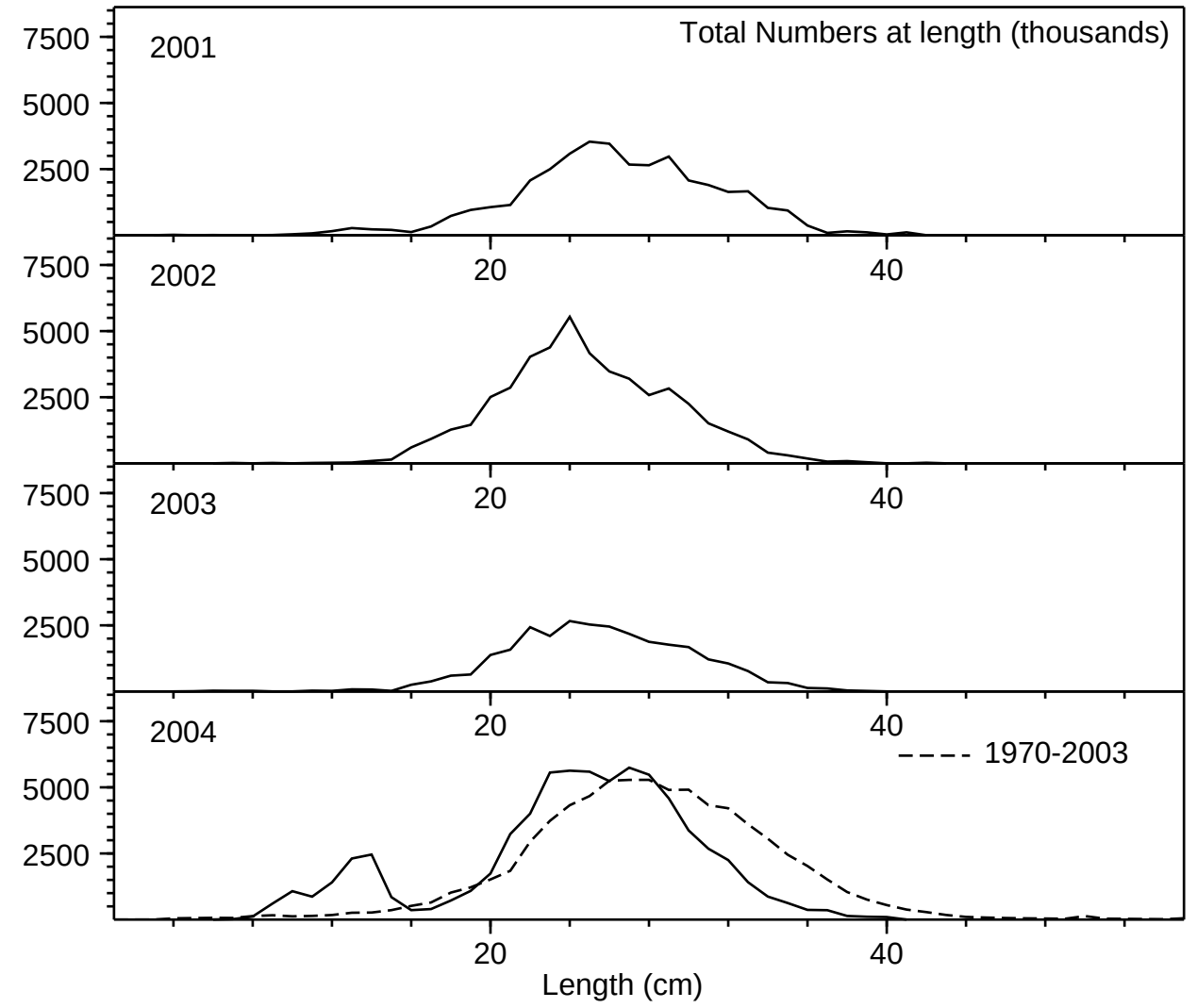

Fig. 38. 4VW Yellowtail Flounder length frequency distribution from the SUMMER Groundfish surveys.

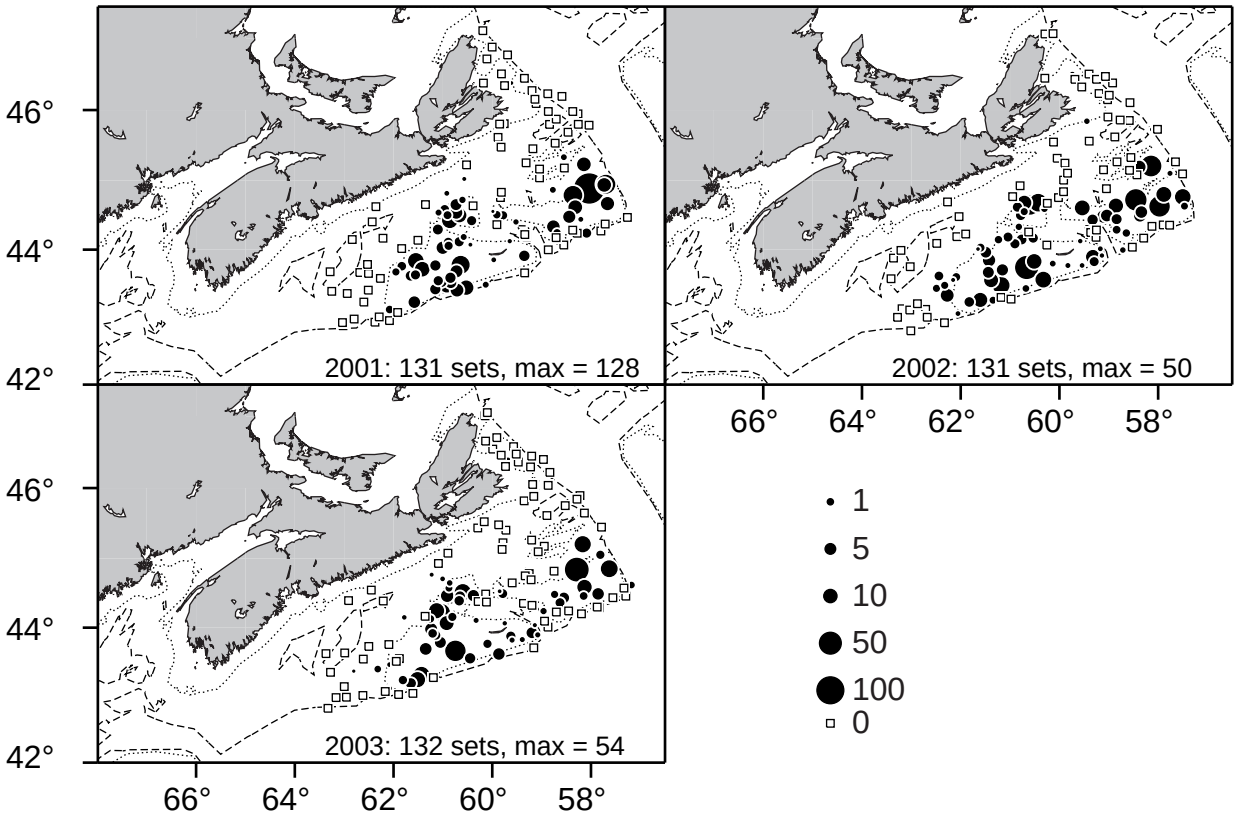

Fig. 39. 4VW Yellowtail Flounder Biomass (kg/tow) from the 2001-2003 SUMMER Groundfish Surveys.

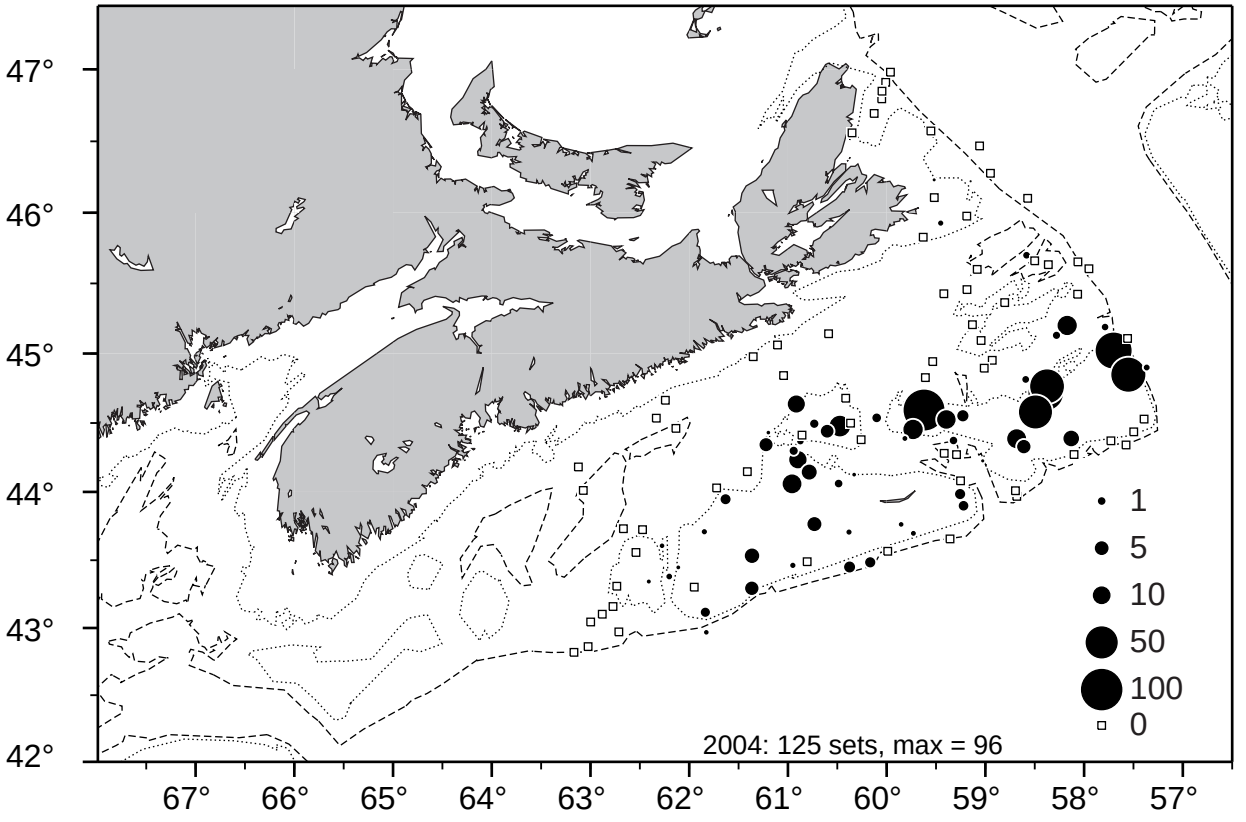

Fig. 40. 4VW Yellowtail Flounder Biomass (kg/tow) from the 2004 SUMMER Groundfish Survey.

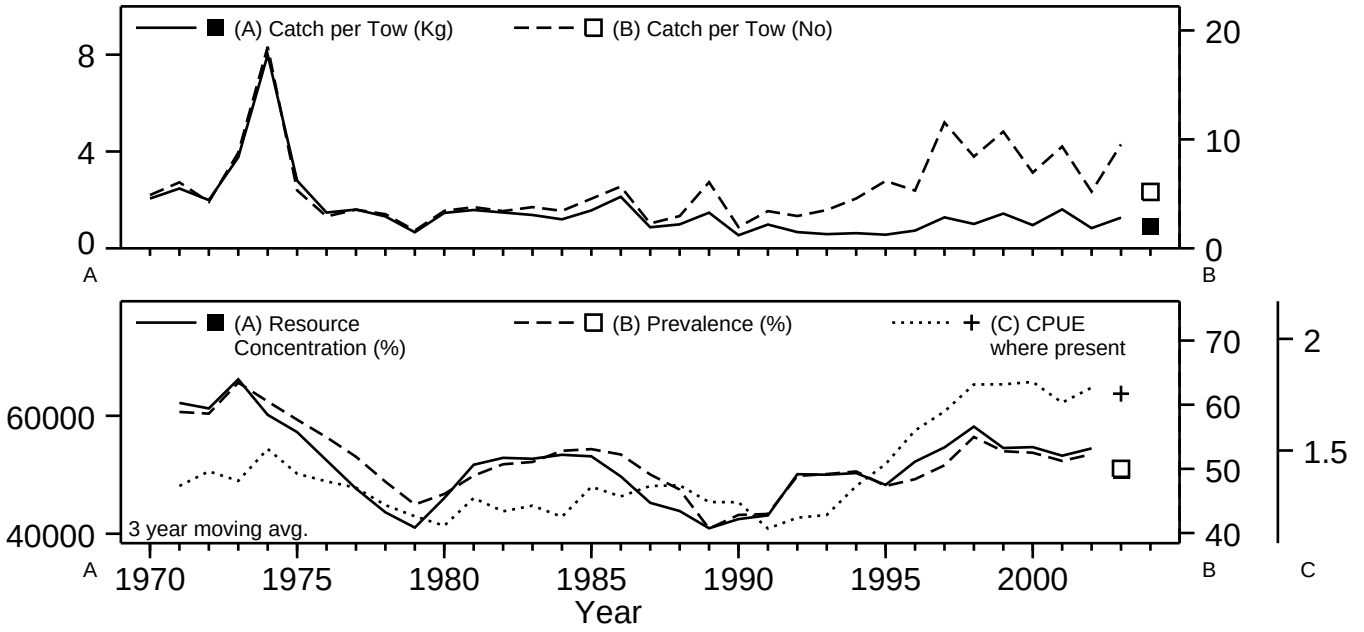

Fig. 41. 4VW Witch Flounder stratified mean weight caught per tow, stratified mean number caught per tow, resource concentration, prevalence, CPUE where present (log number/tow) from the SUMMER Groundfish surveys. The catch for 2004 was sampled using the MV Teleost. It has not been calibrated, and should not be compared to the earlier time series.

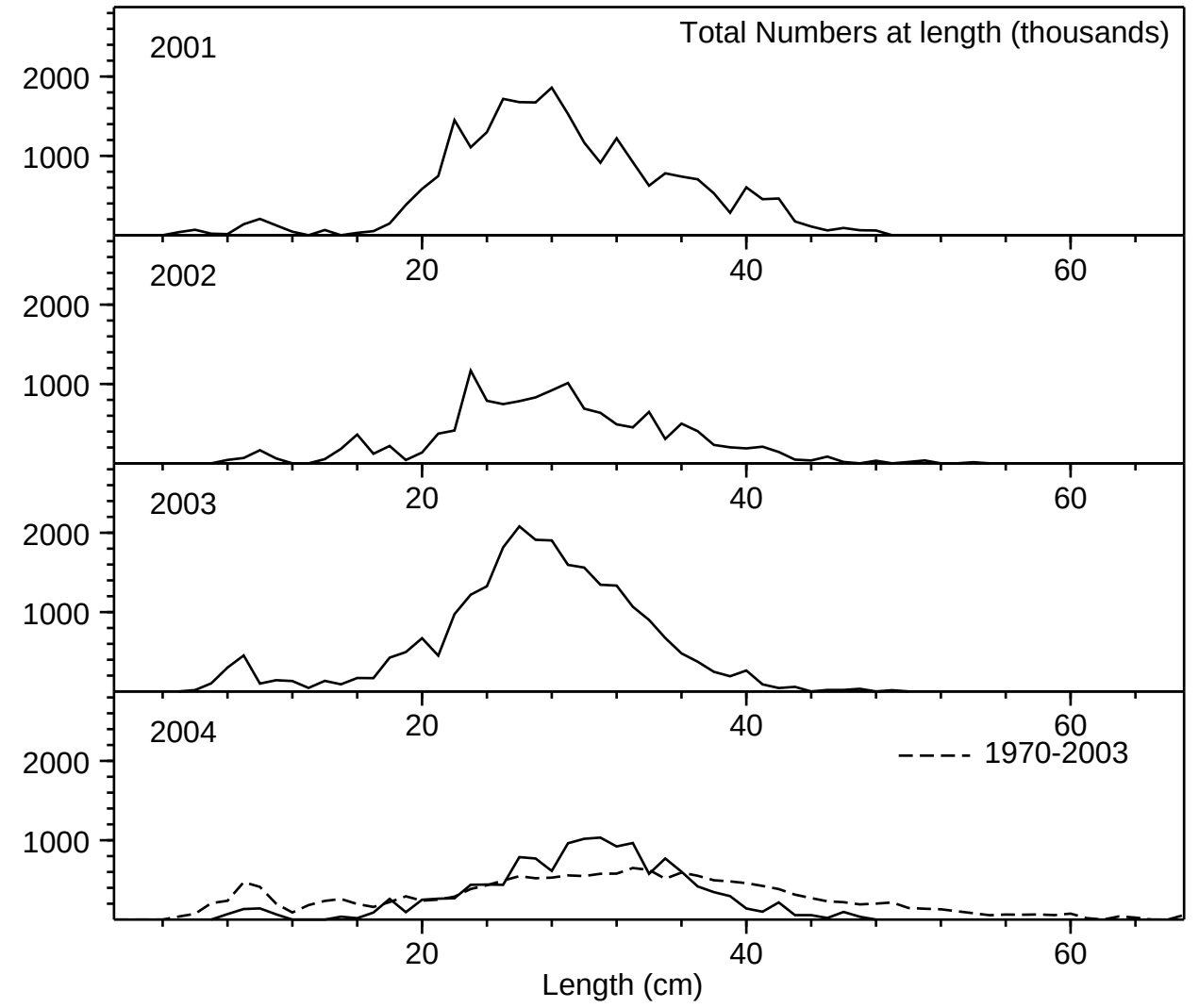

Fig. 42. 4VW Witch Flounder length frequency distribution from the SUMMER Groundfish surveys.

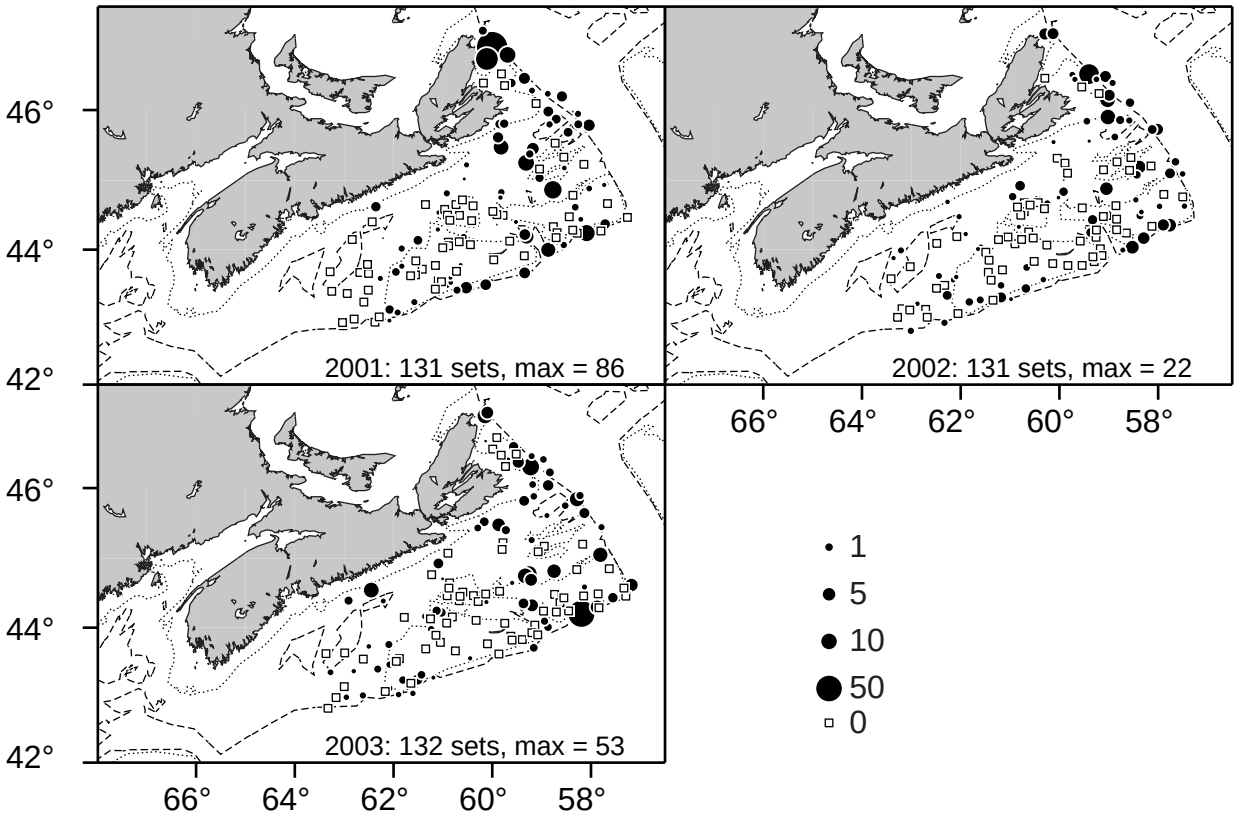

Fig. 43. 4VW Witch Flounder Biomass (kg/tow) from the 2001-2003 SUMMER Groundfish Surveys.

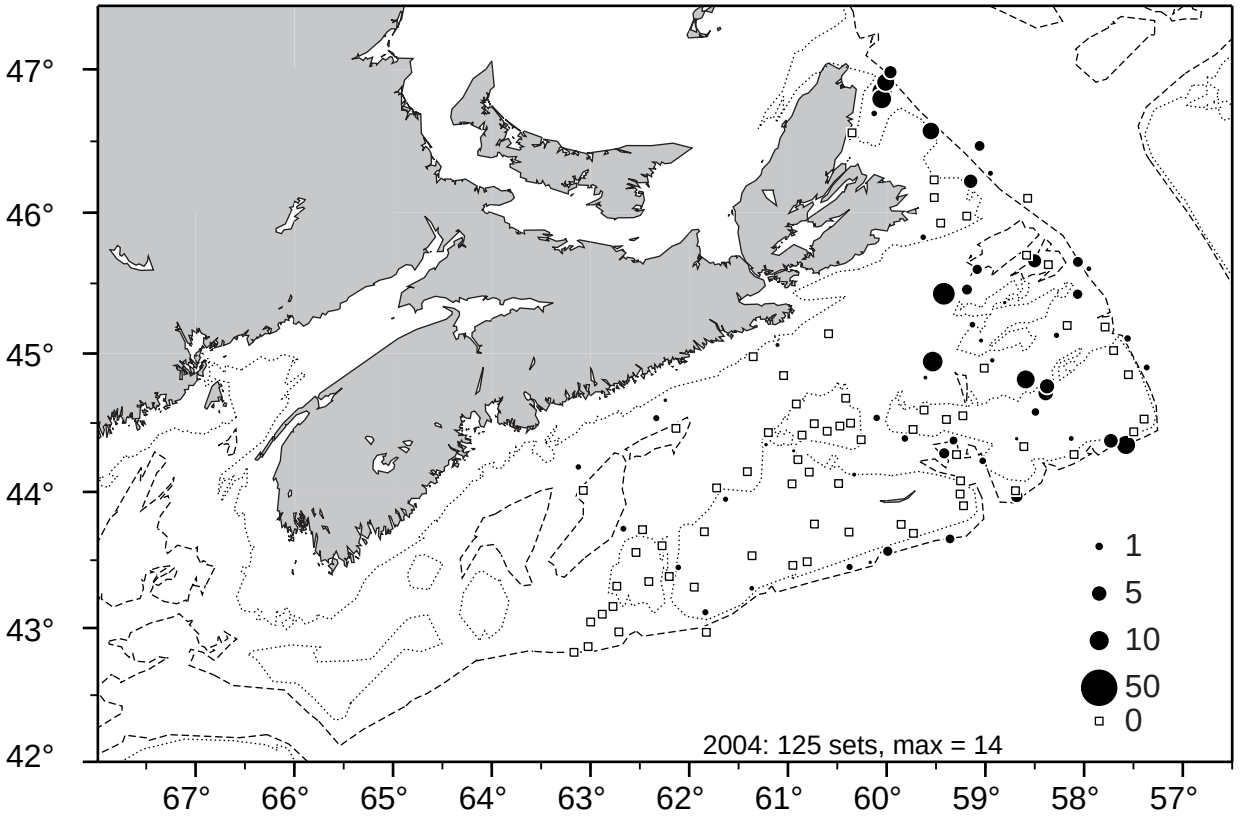

Fig. 44. 4VW Witch Flounder Biomass (kg/tow) from the 2004 SUMMER Groundfish Survey.

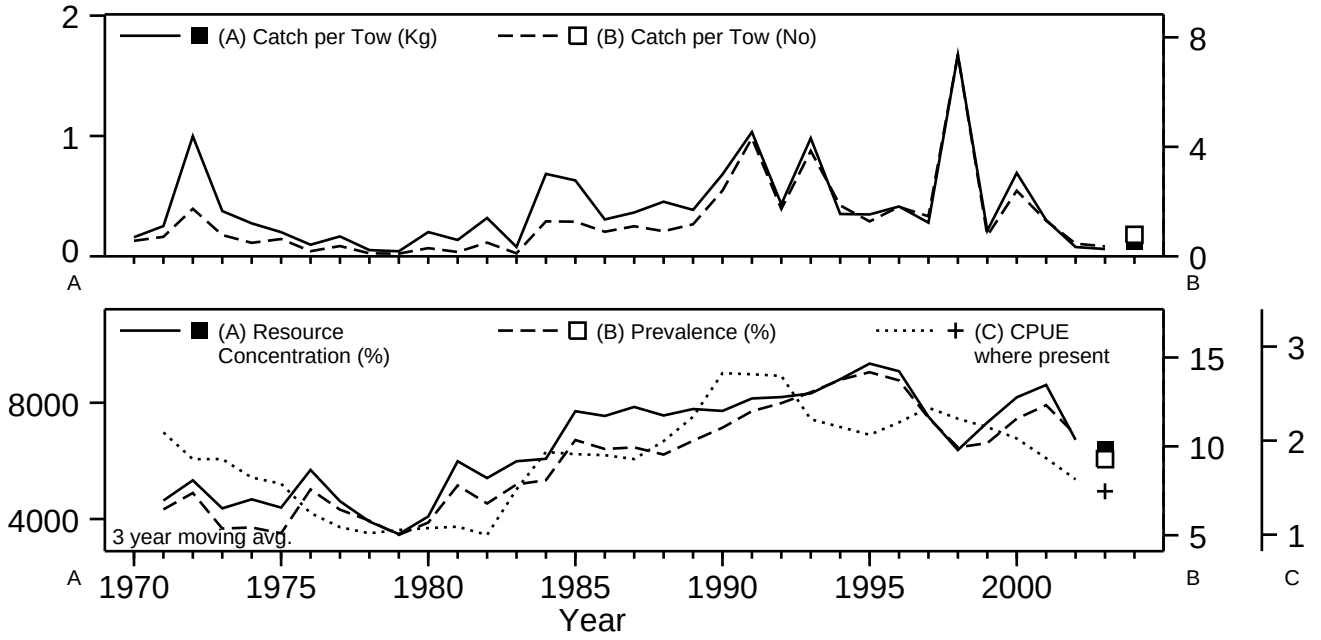

Fig. 45. 4VW Winter Flounder stratified mean weight caught per tow, stratified mean number caught per tow, resource concentration, prevalence, CPUE where present (log number/tow) from the SUMMER Groundfish surveys. The catch for 2004 was sampled using the MV Teleost. It has not been calibrated, and should not be compared to the earlier time series.

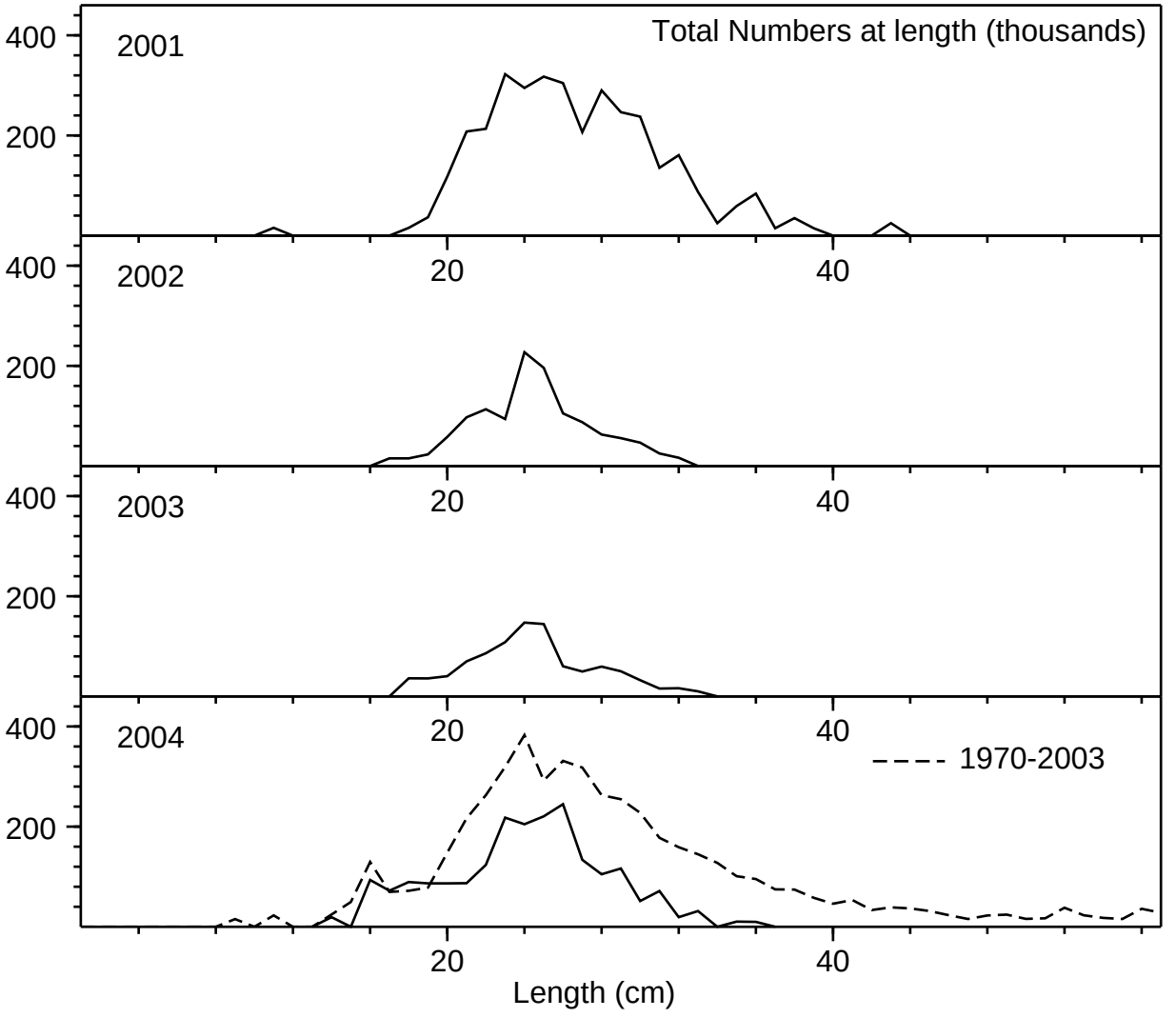

Fig. 46. 4VW Winter Flounder length frequency distribution from the SUMMER Groundfish surveys.

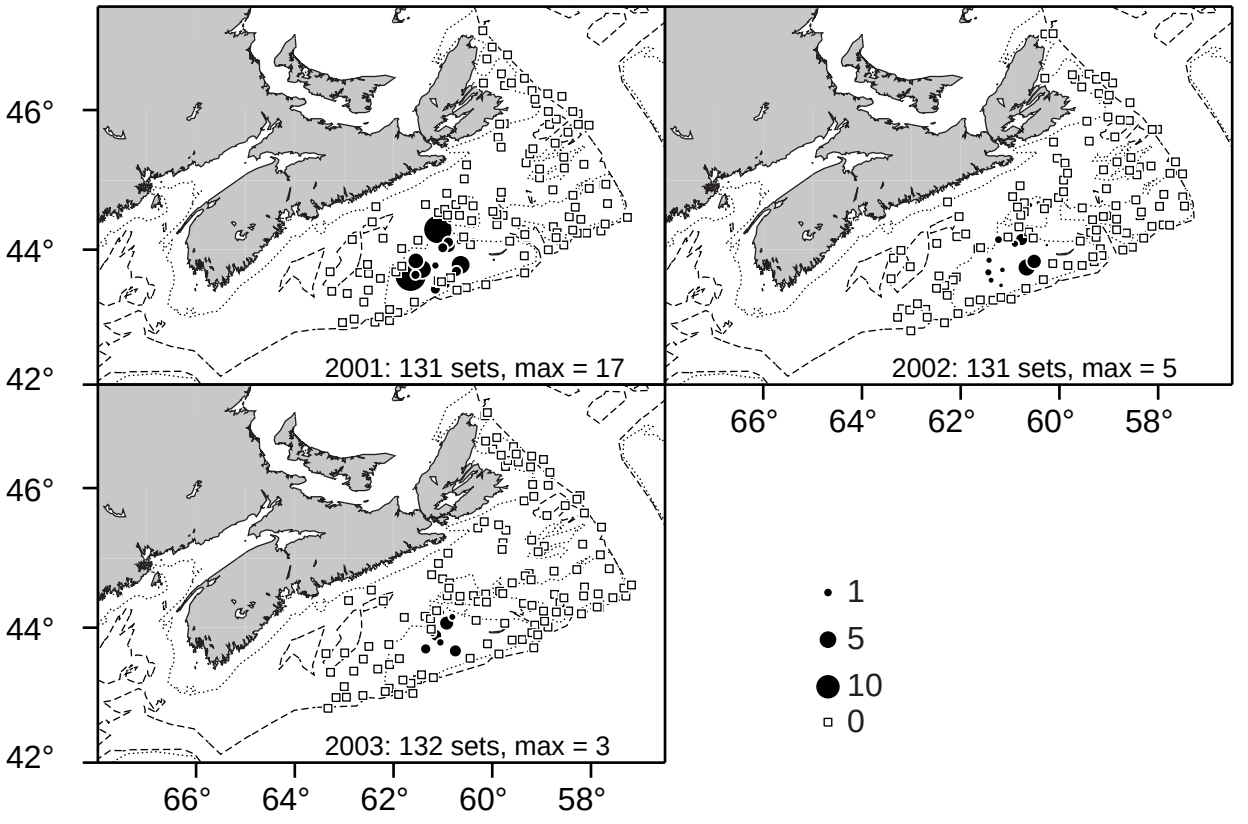

Fig. 47. 4VW Winter Flounder Biomass (kg/tow) from the 2001-2003 SUMMER Groundfish Surveys.

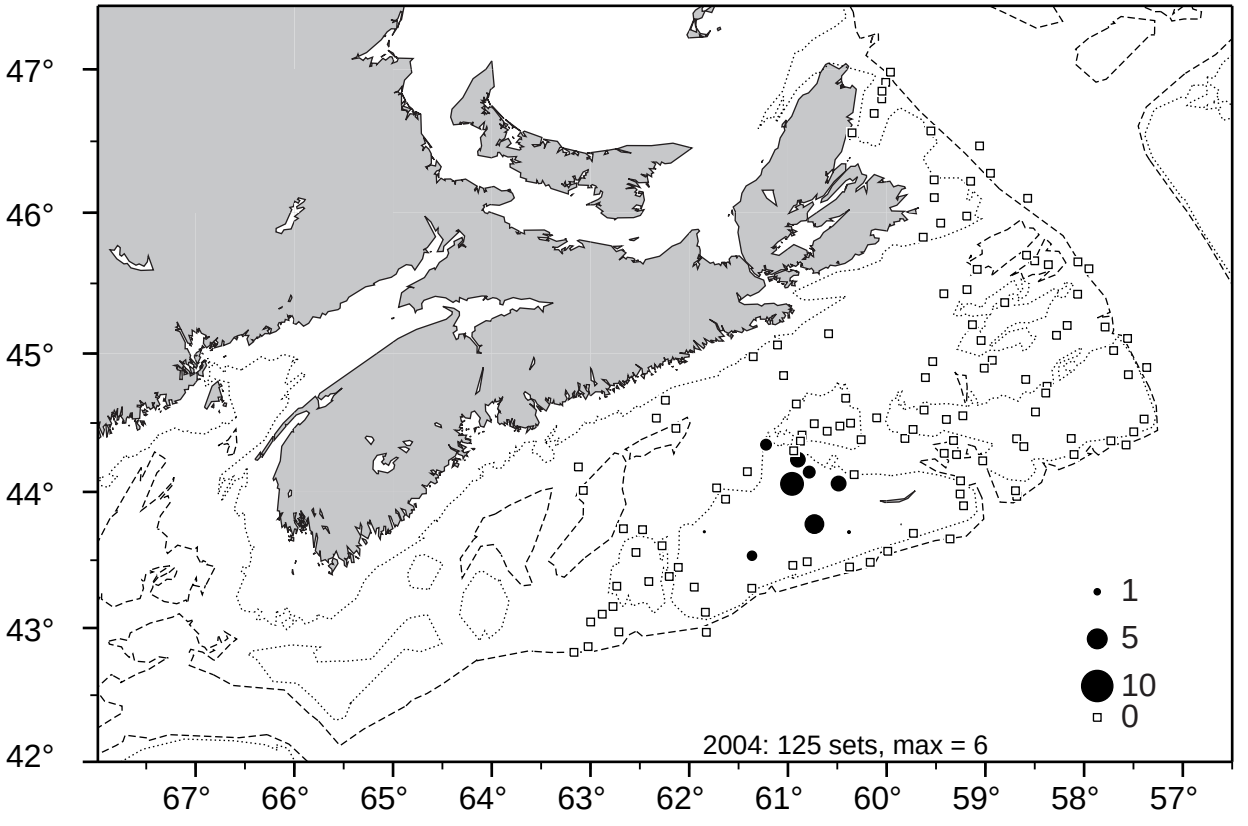

Fig. 48. 4VW Winter Flounder Biomass (kg/tow) from the 2004 SUMMER Groundfish Survey.

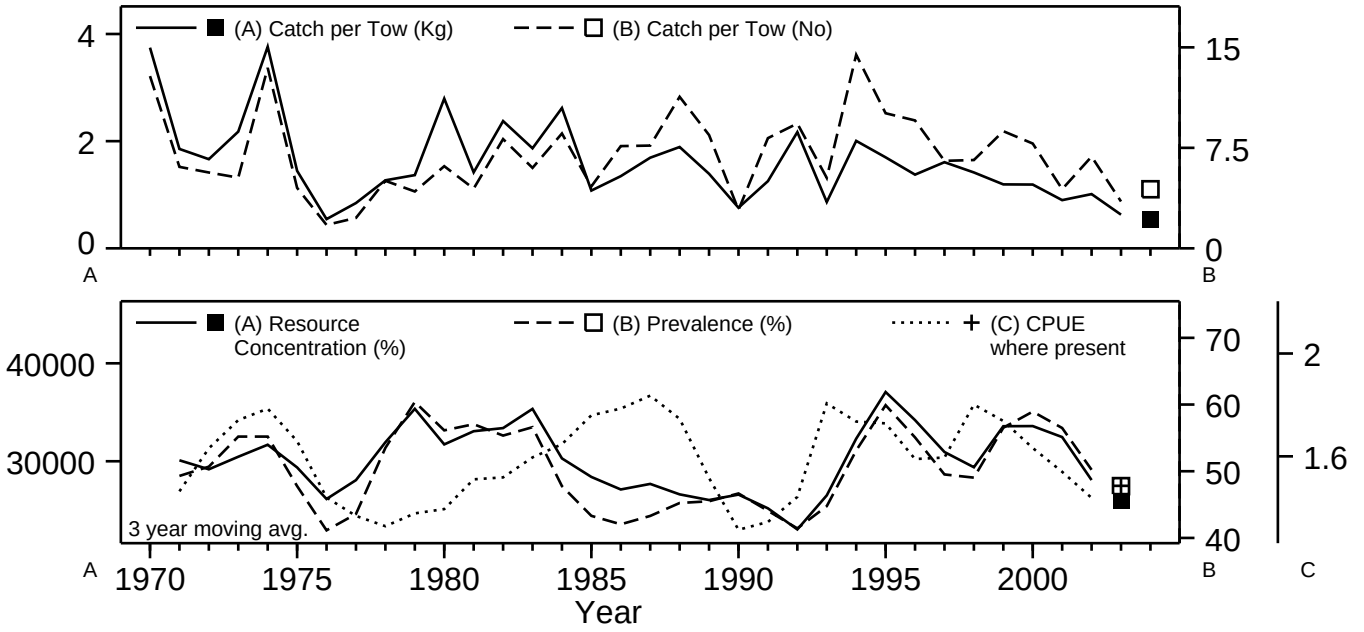

Fig. 49. 4X American Plaice stratified mean weight caught per tow, stratified mean number caught per tow, resource concentration, prevalence, CPUE where present (log number/tow) from the SUMMER Groundfish surveys. The catch for 2004 was sampled using the MV Teleost. It has not been calibrated, and should not be compared to the earlier time series.

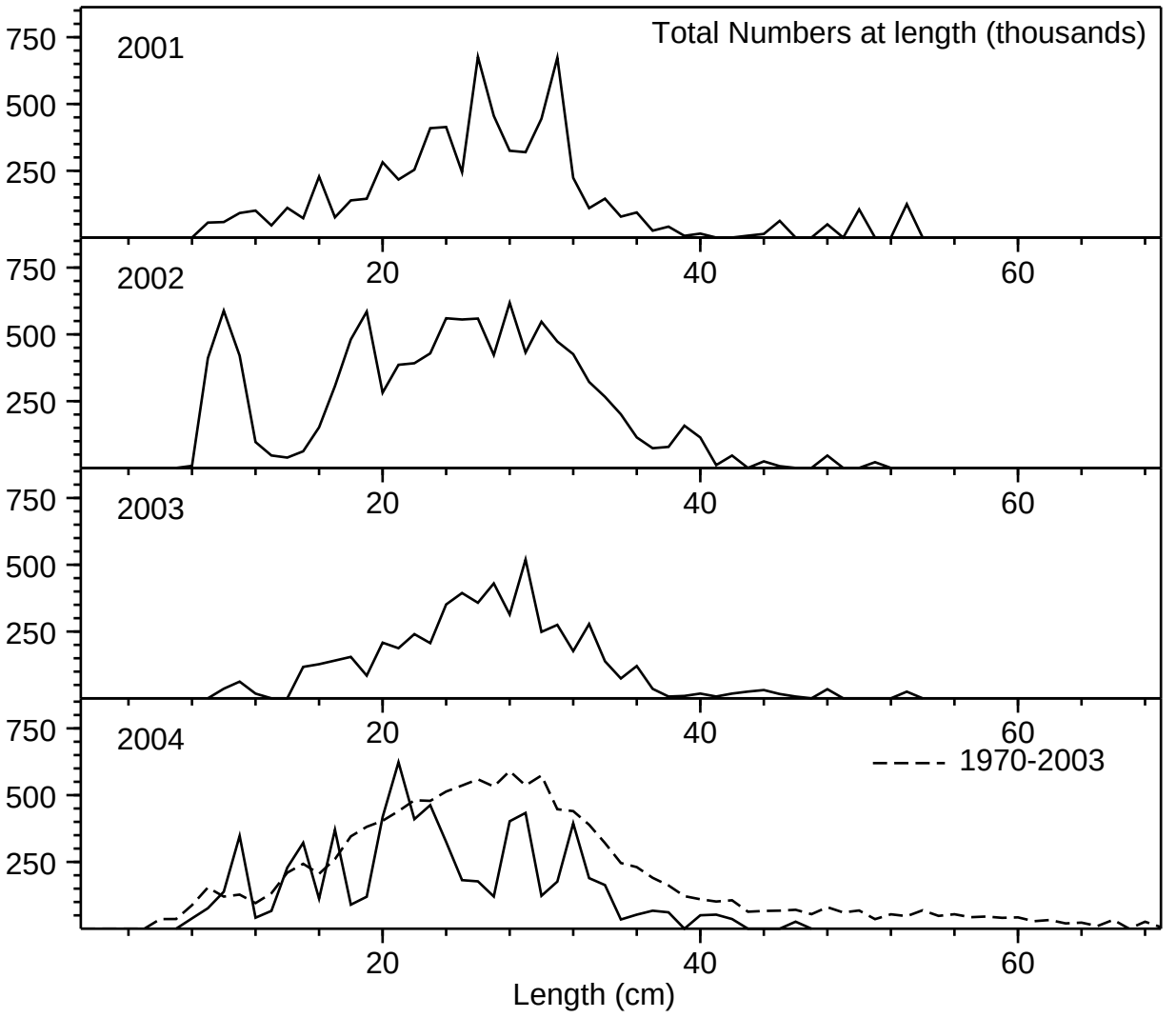

Fig. 50. 4X American Plaice length frequency distribution from the SUMMER Groundfish surveys.

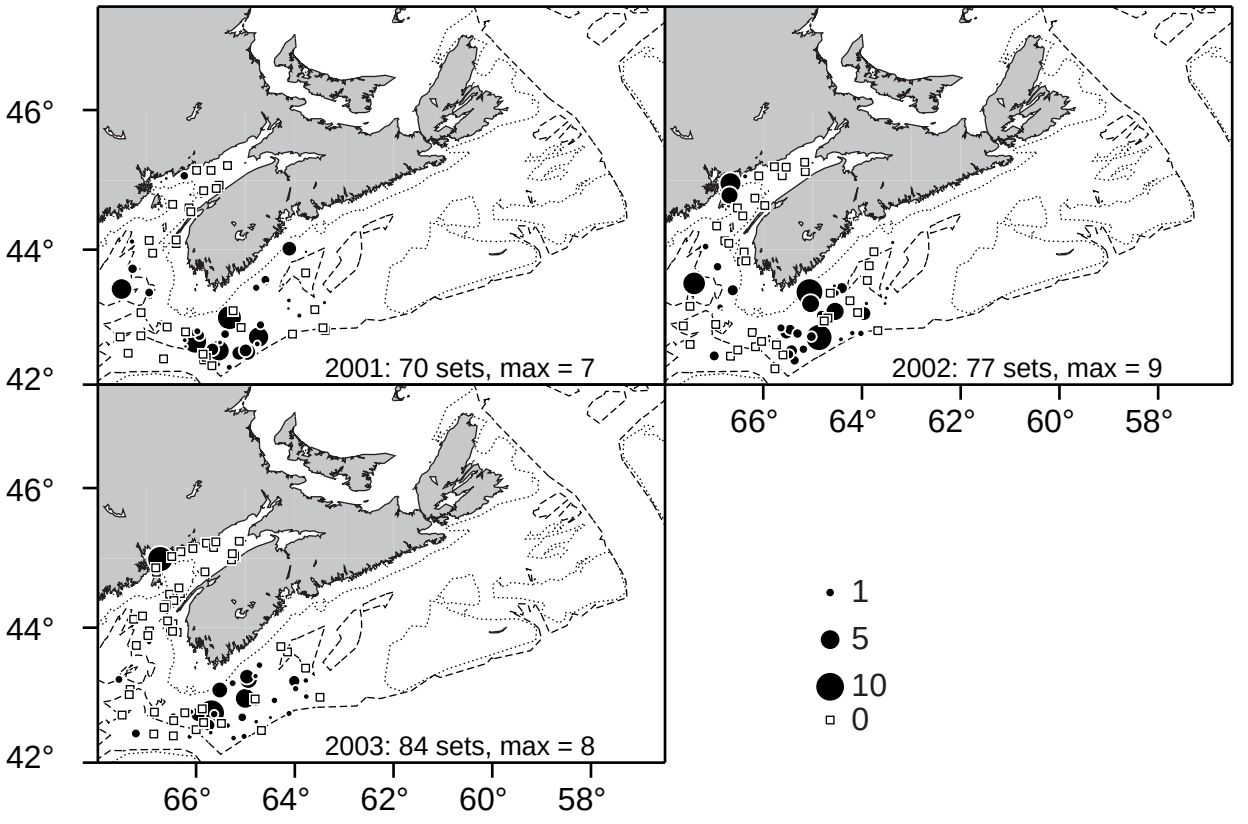

Fig. 51. 4X American Plaice Biomass (kg/tow) from the 2001-2003 SUMMER Groundfish Surveys.

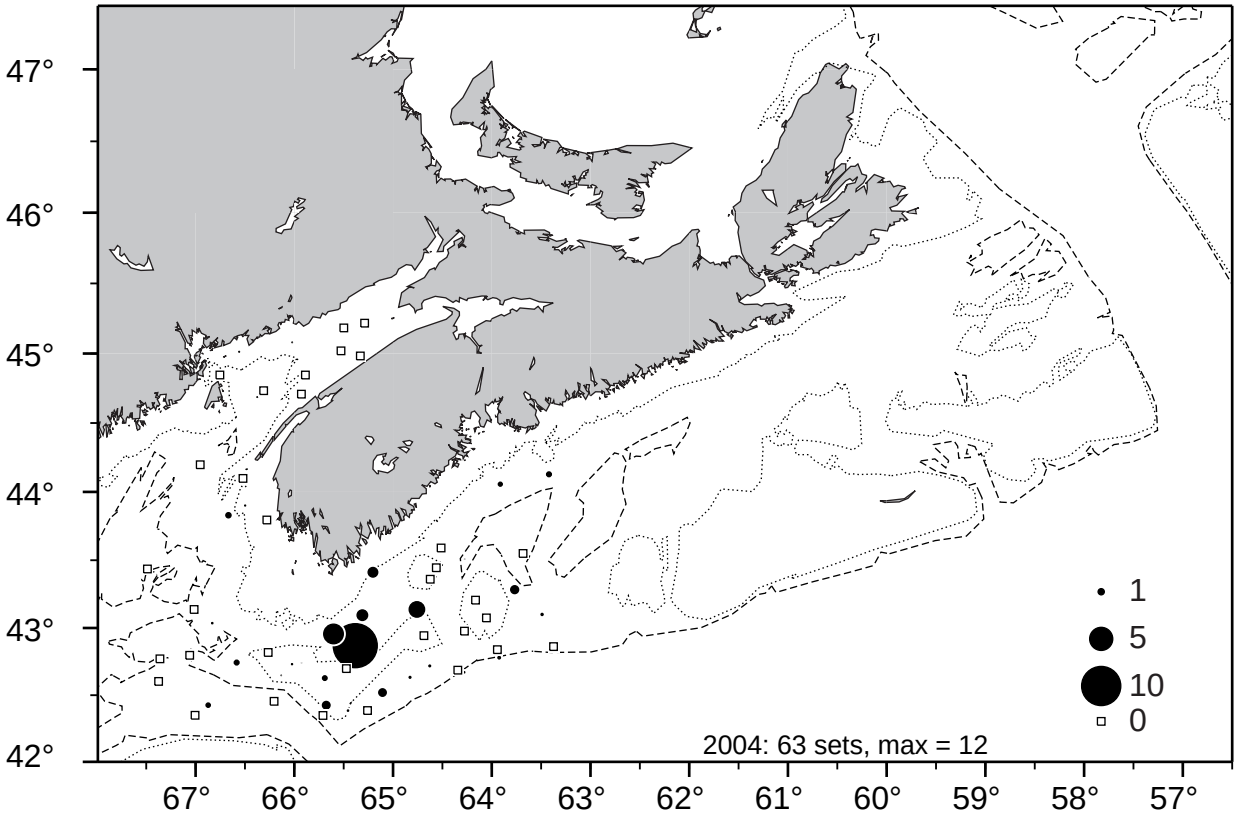

Fig. 52. 4X American Plaice Biomass (kg/tow) from the 2004 SUMMER Groundfish Survey.

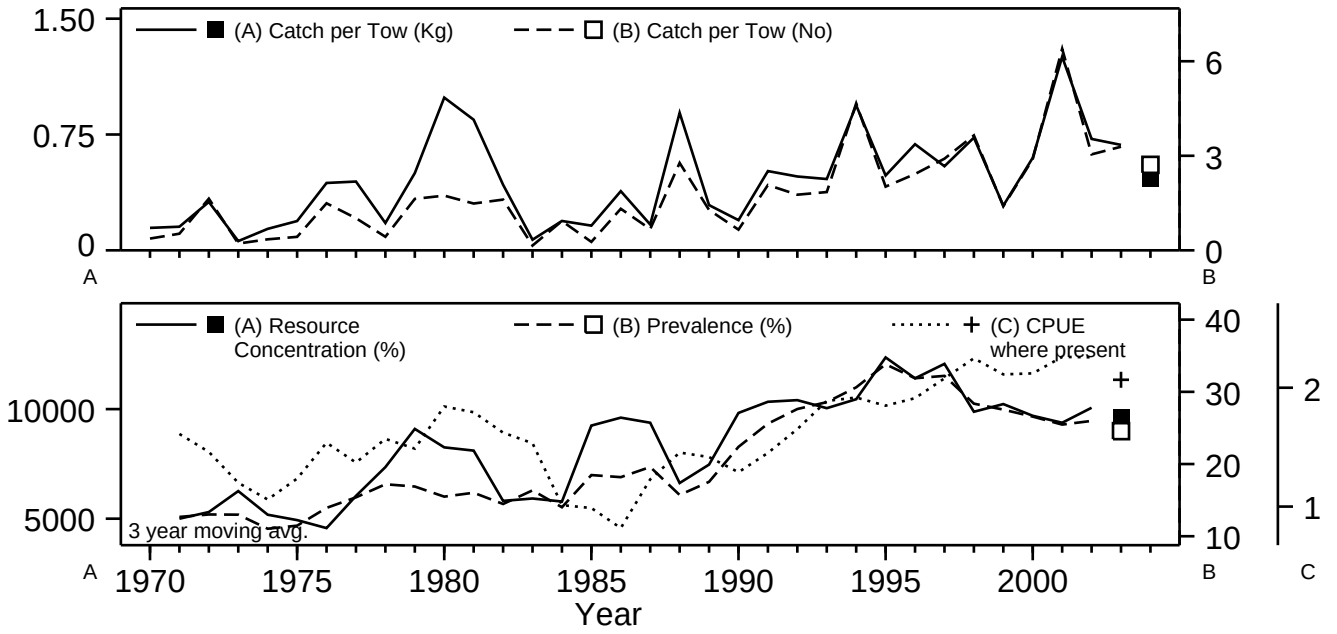

Fig. 53. 4X Yellowtail Flounder stratified mean weight caught per tow, stratified mean number caught per tow, resource concentration, prevalence, CPUE where present (log number/tow) from the SUMMER Groundfish surveys. The catch for 2004 was sampled using the MV Teleost. It has not been calibrated, and should not be compared to the earlier time series.

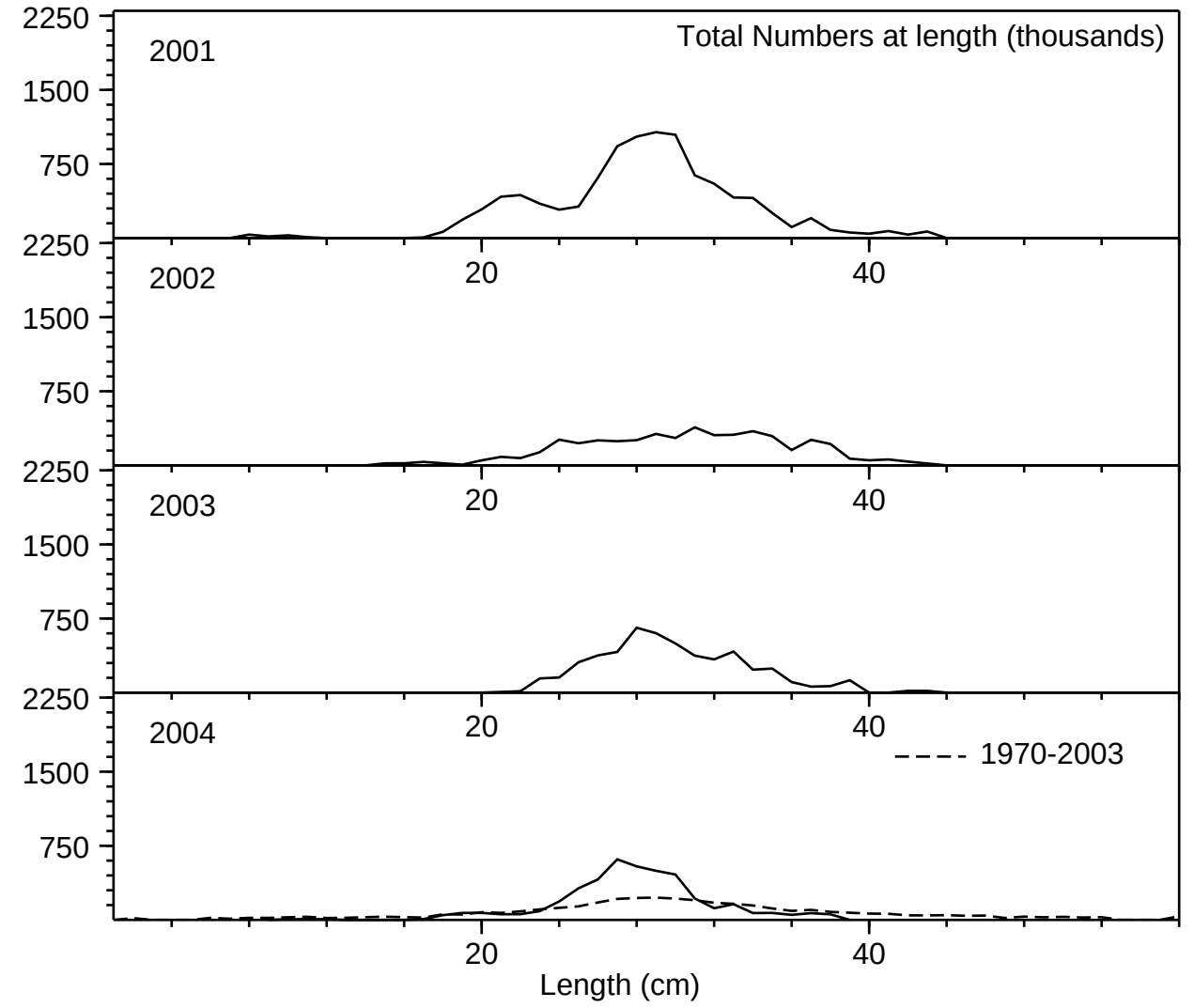

Fig. 54. 4X Yellowtail Flounder length frequency distribution from the SUMMER Groundfish surveys.

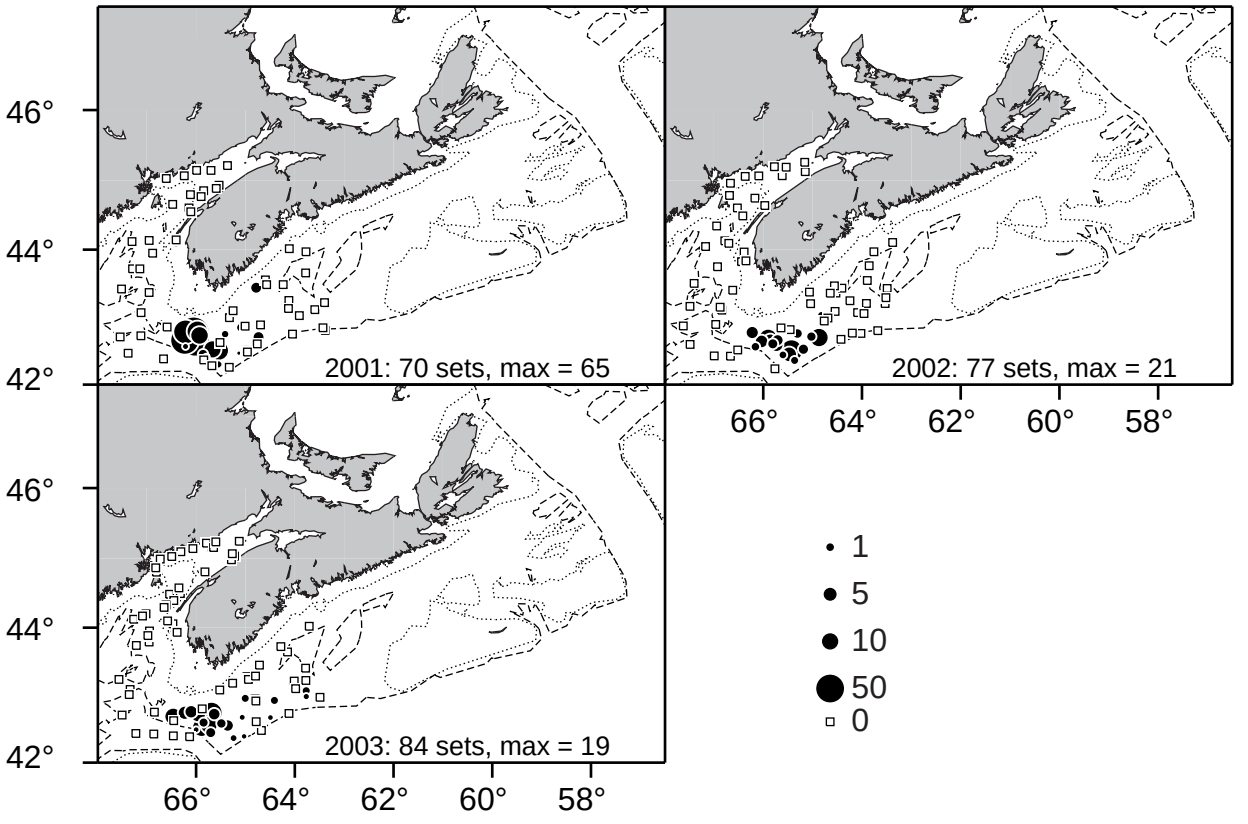

Fig. 55. 4X Yellowtail Flounder Biomass (kg/tow) from the 2001-2003 SUMMER Groundfish Surveys.

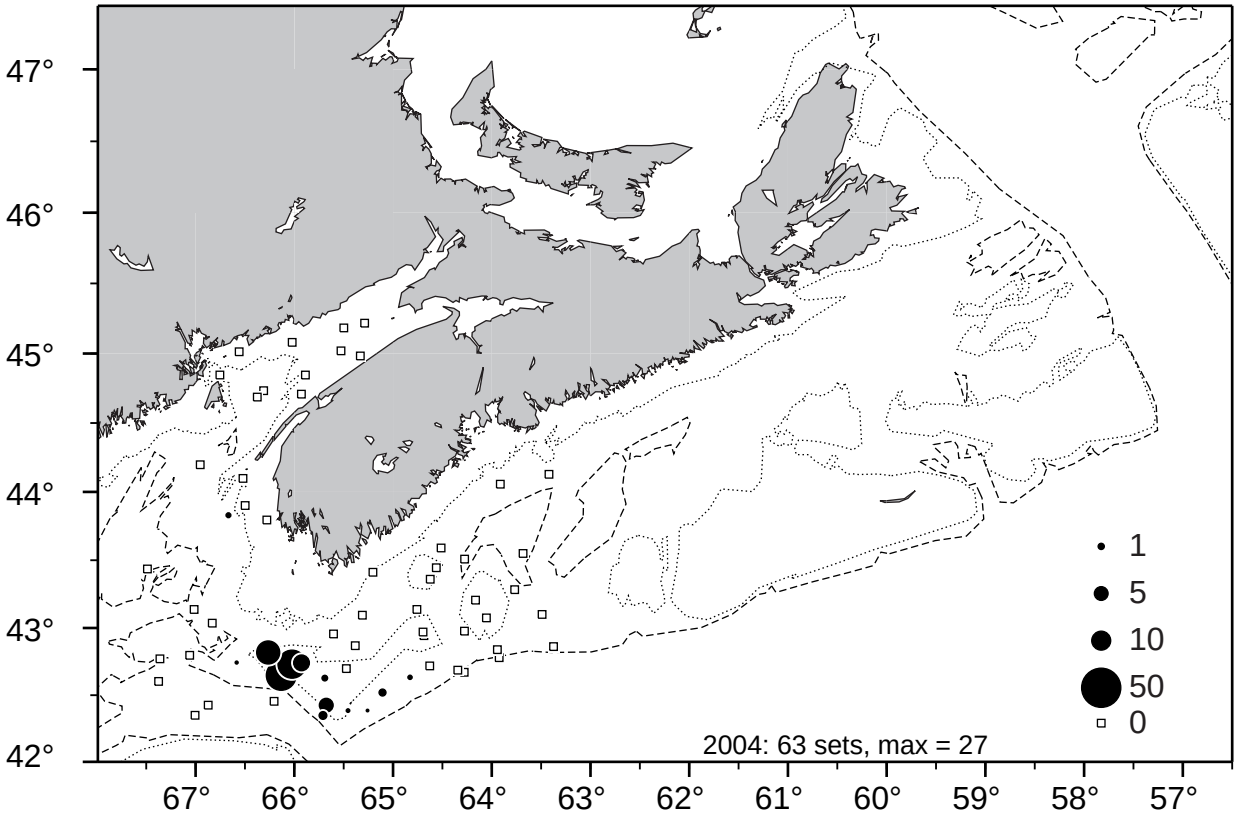

Fig. 56. 4X Yellowtail Flounder Biomass (kg/tow) from the 2004 SUMMER Groundfish Survey.

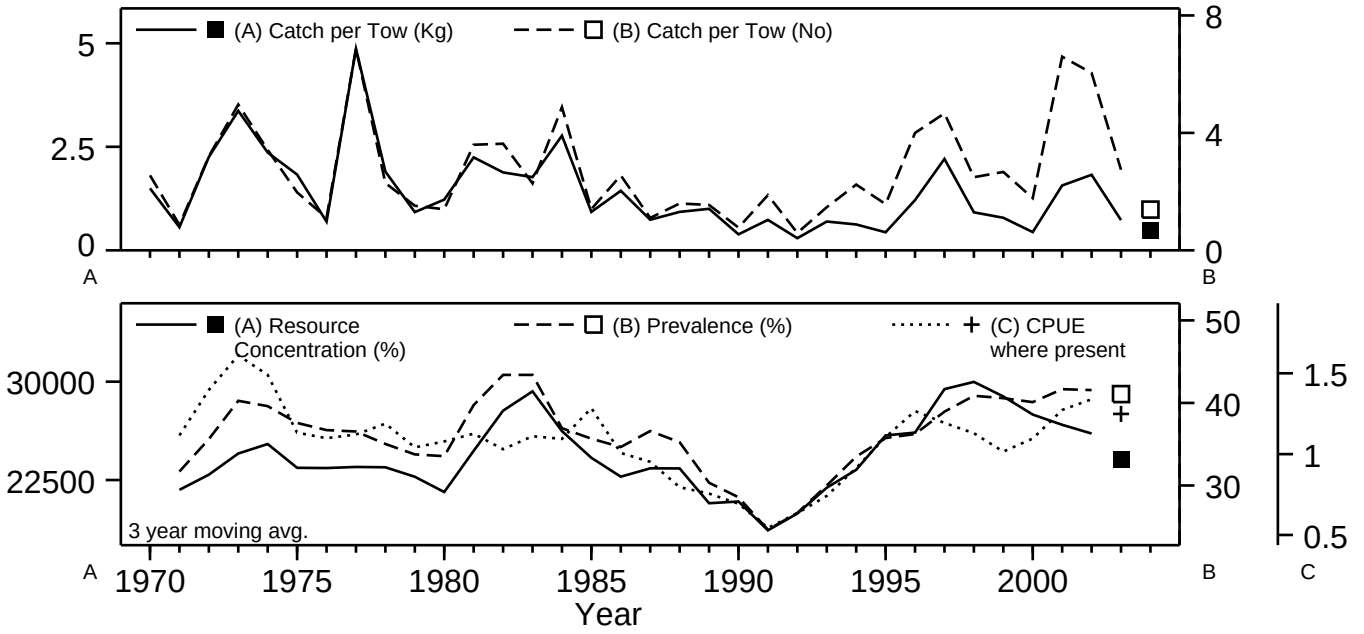

Fig. 57. 4X Witch Flounder stratified mean weight caught per tow, stratified mean number caught per tow, resource concentration, prevalence, CPUE where present (log number/tow) from the SUMMER Groundfish surveys. The catch for 2004 was sampled using the MV Teleost. It has not been calibrated, and should not be compared to the earlier time series.

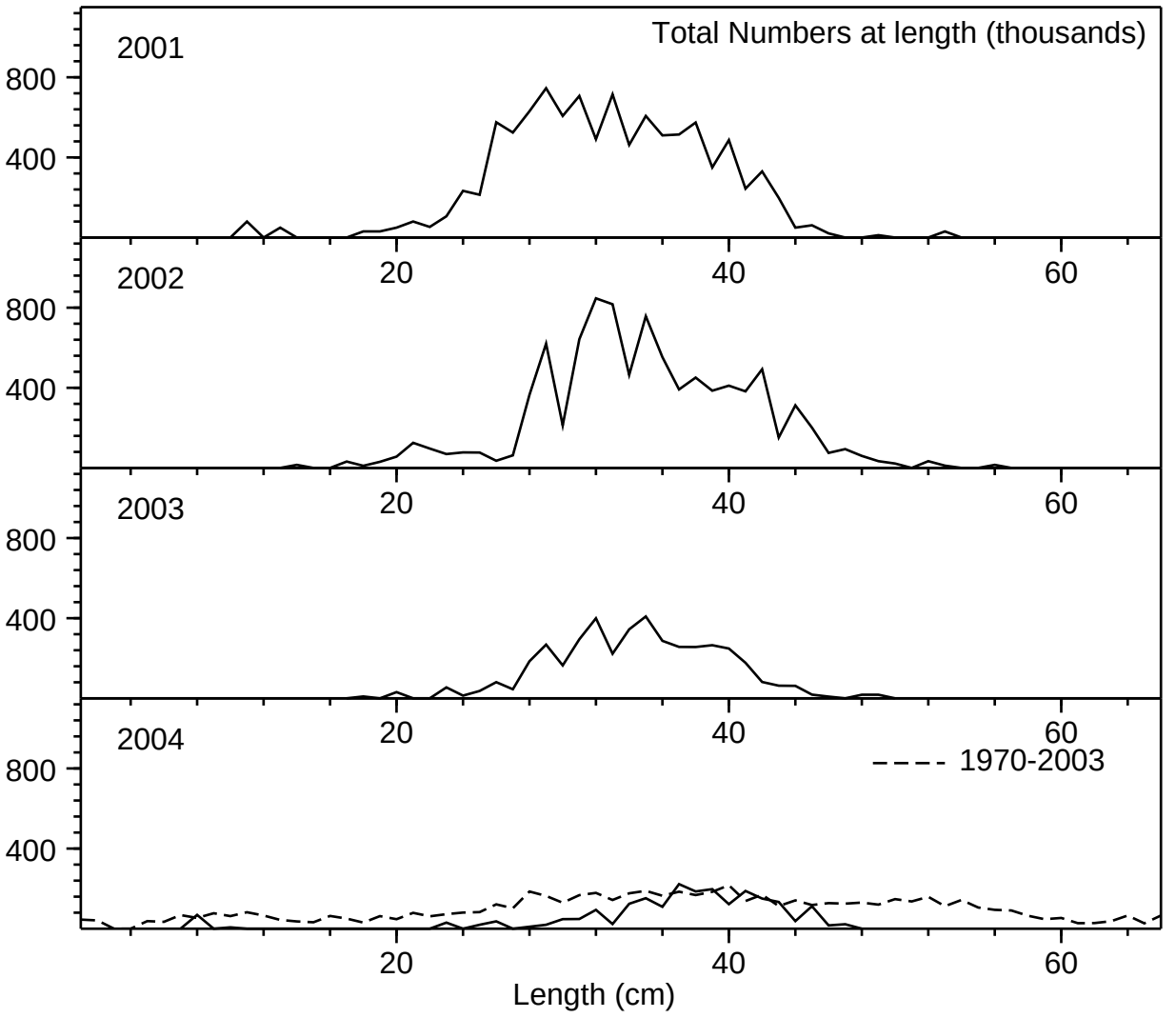

Fig. 58. 4X Witch Flounder length frequency distribution from the SUMMER Groundfish surveys.

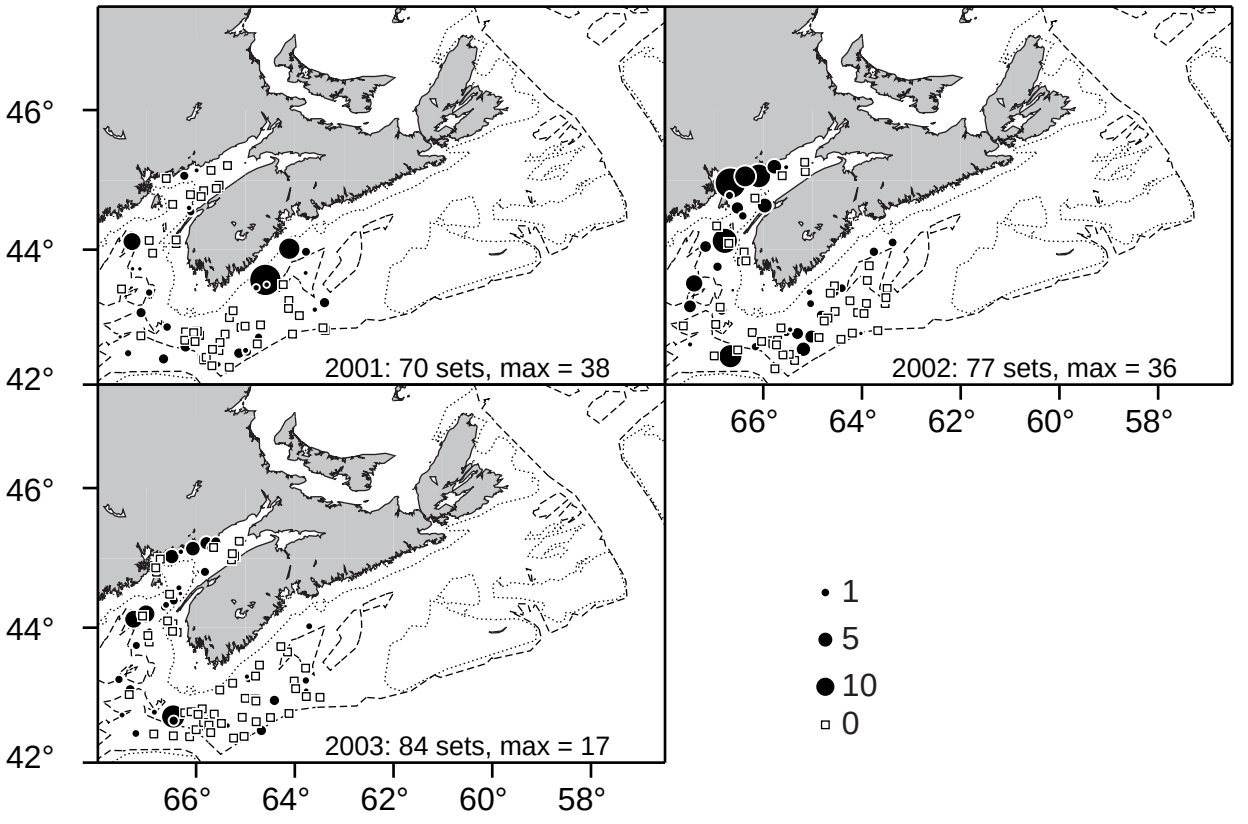

Fig. 59. 4X Witch Flounder Biomass (kg/tow) from the 2001-2003 SUMMER Groundfish Surveys.

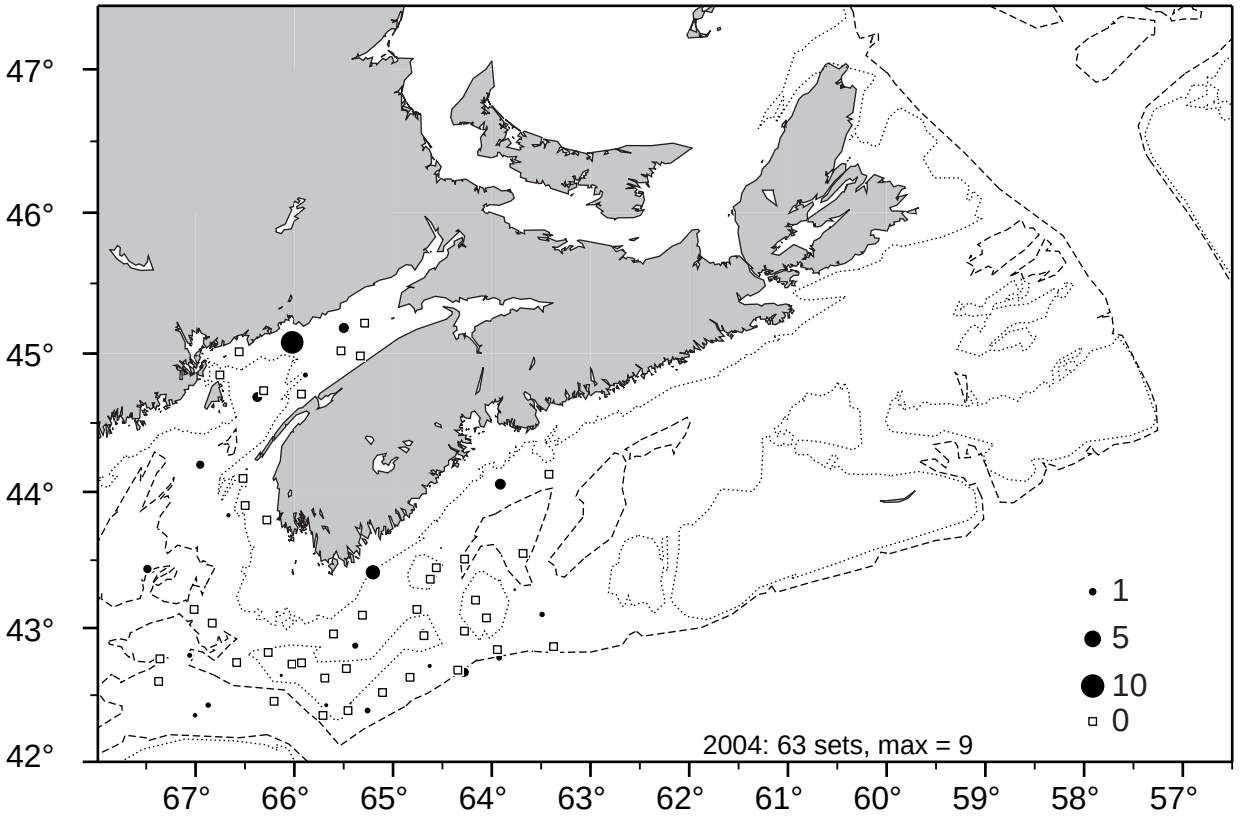

Fig. 60. 4X Witch Flounder Biomass (kg/tow) from the 2004 SUMMER Groundfish Survey.

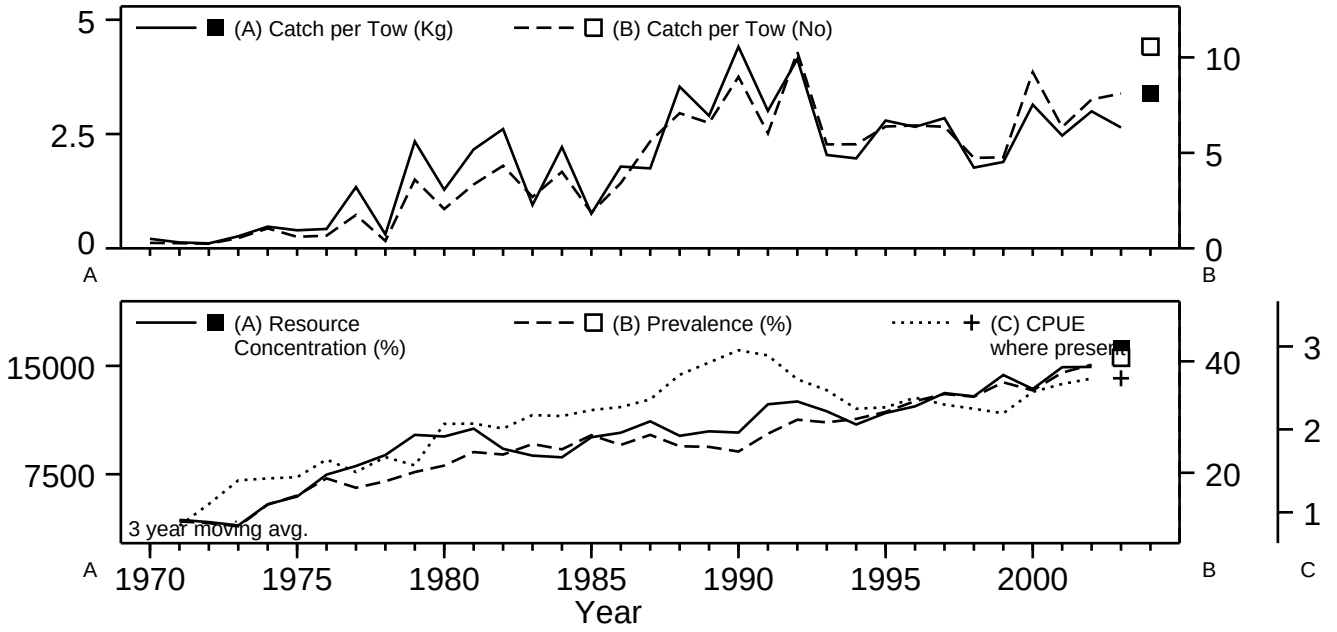

Fig. 61. 4X Winter Flounder stratified mean weight caught per tow, stratified mean number caught per tow, resource concentration, prevalence, CPUE where present (log number/tow) from the SUMMER Groundfish surveys. The catch for 2004 was sampled using the MV Teleost. It has not been calibrated, and should not be compared to the earlier time series.

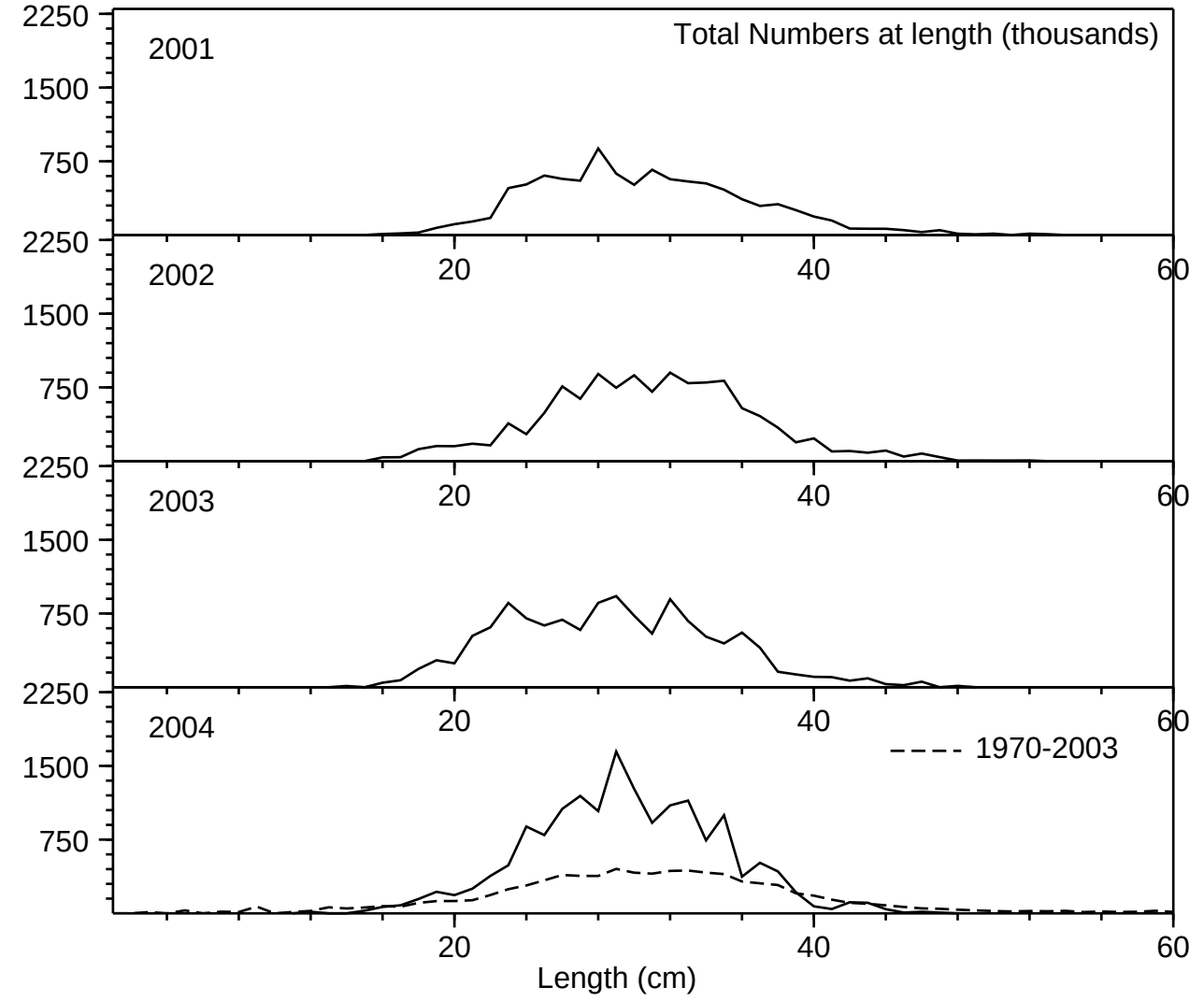

Fig. 62. 4X Winter Flounder length frequency distribution from the SUMMER Groundfish surveys.

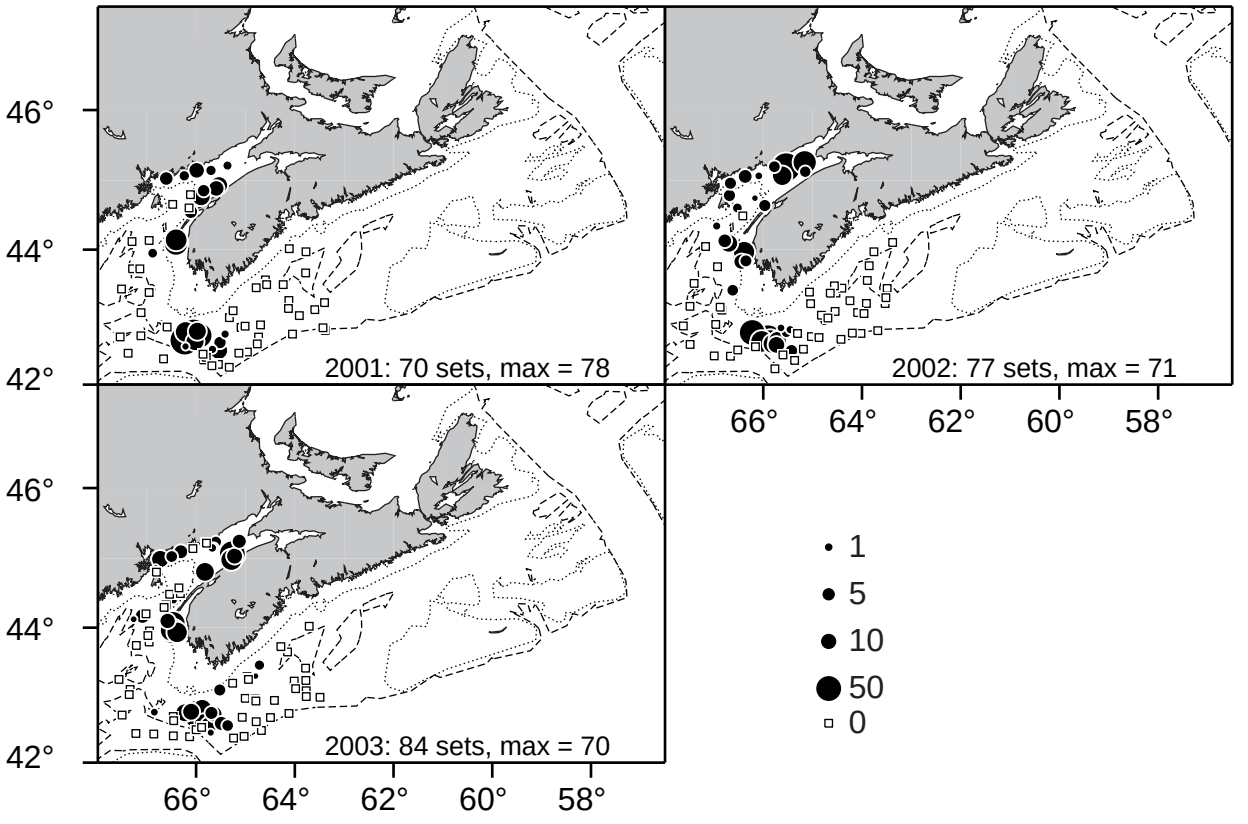

Fig. 63. 4X Winter Flounder Biomass (kg/tow) from the 2001-2003 SUMMER Groundfish Surveys.

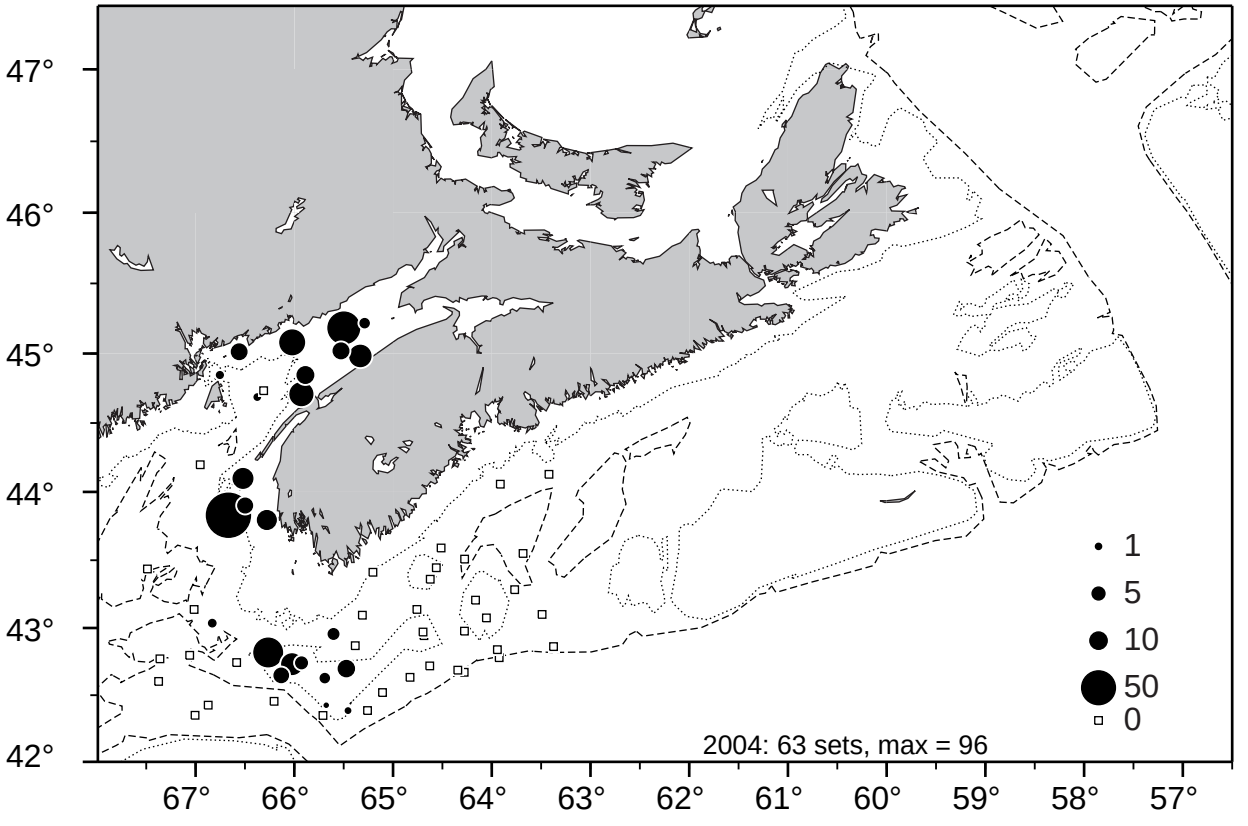

Fig. 64. 4X Winter Flounder Biomass (kg/tow) from the 2004 SUMMER Groundfish Survey.

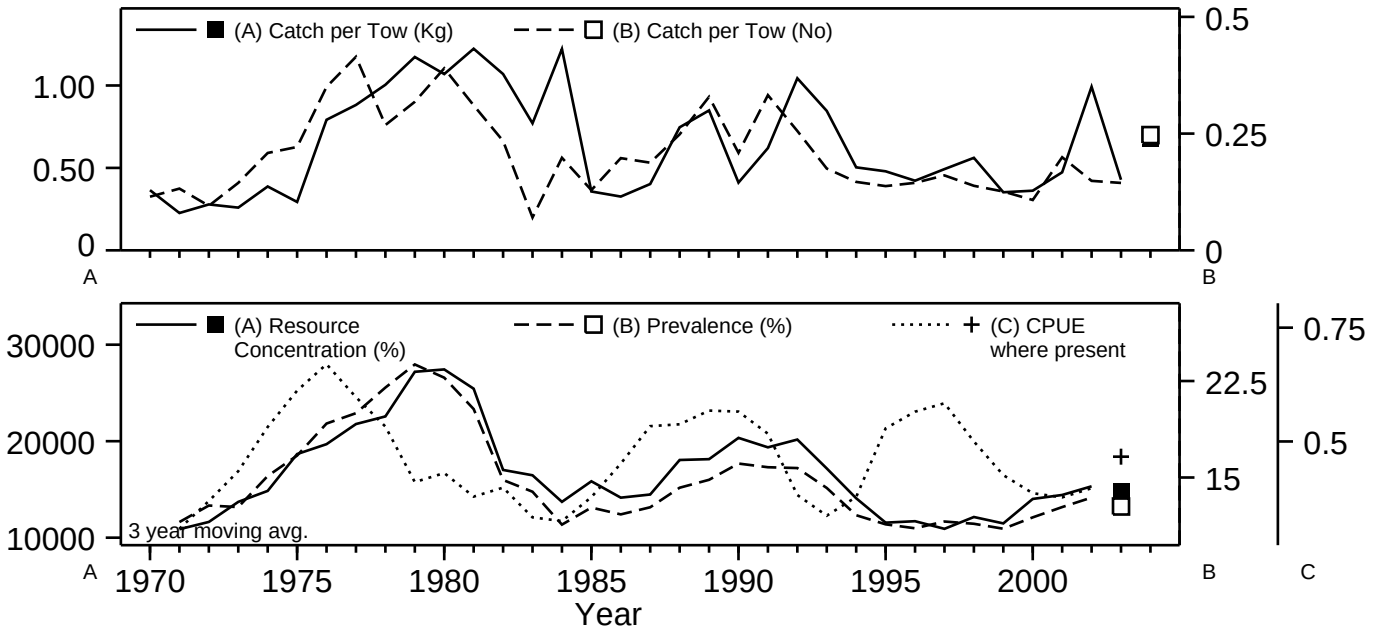

Fig. 65. 4VWX Halibut stratified mean weight caught per tow, stratified mean number caught per tow, resource concentration, prevalence, CPUE where present (log number/tow) from the SUMMER Groundfish surveys. The catch for 2004 was sampled using the MV Teleost. It has not been calibrated, and should not be compared to the earlier time series.

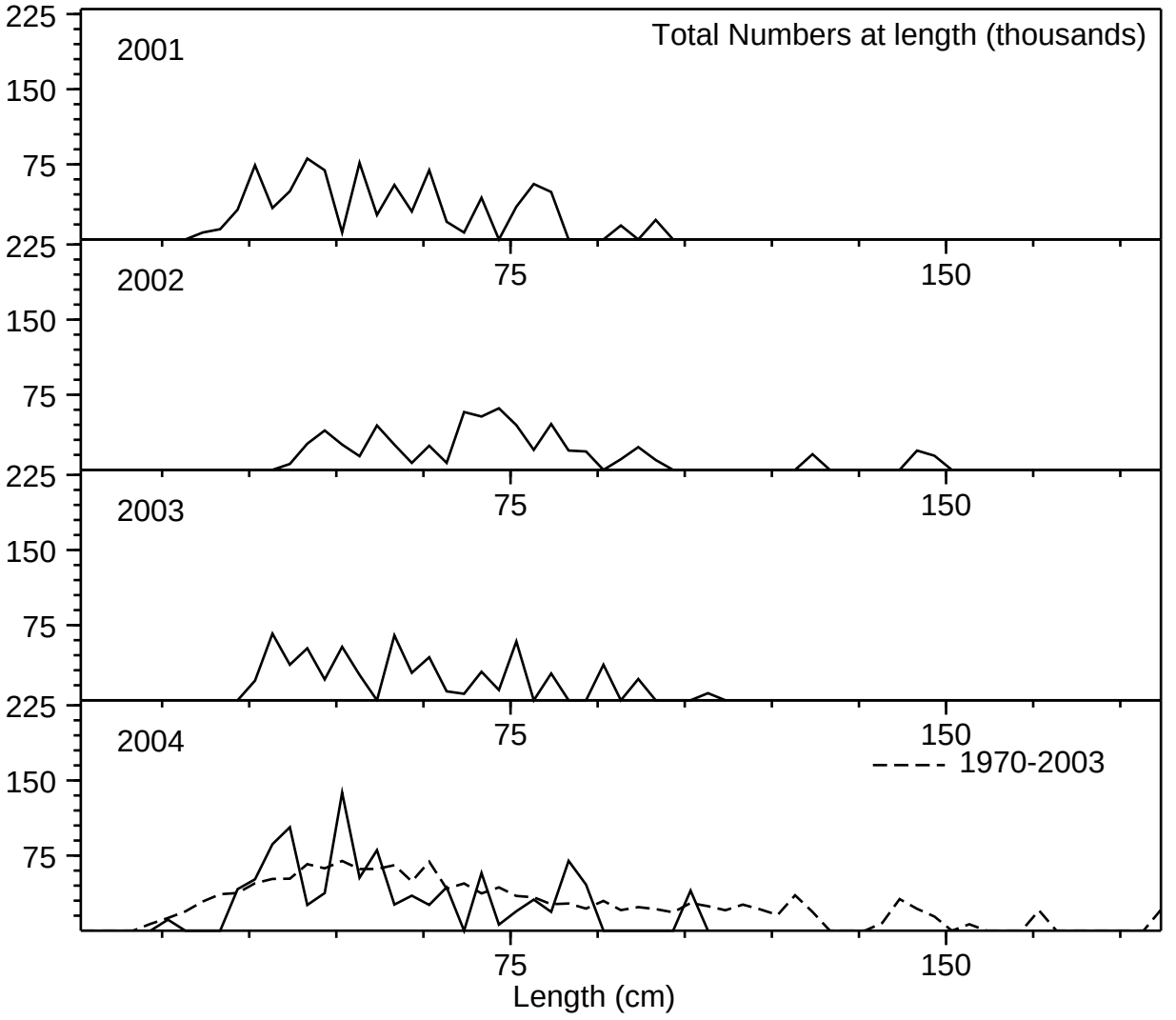

Fig. 66. 4VWX Halibut length frequency distribution from the SUMMER Groundfish surveys.

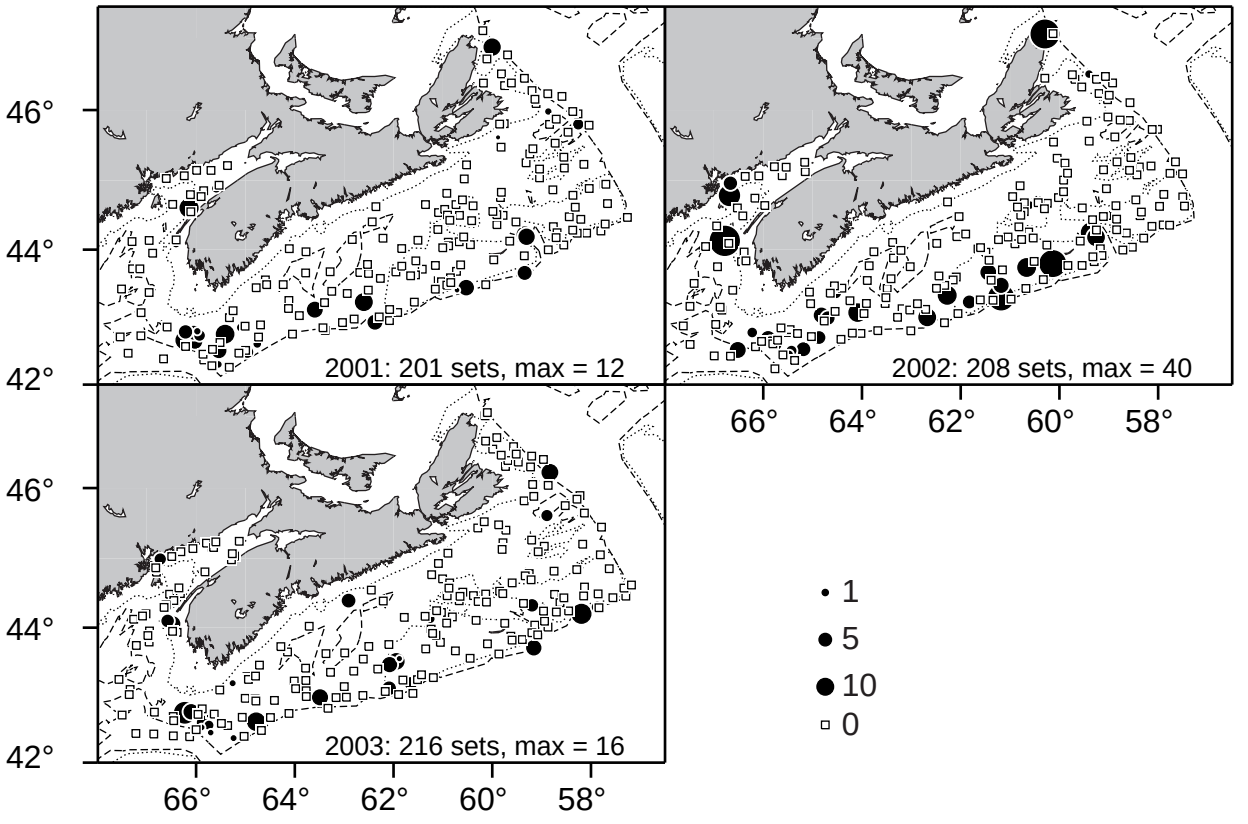

Fig. 67. 4VWX Halibut Biomass (kg/tow) from the 2001-2003 SUMMER Groundfish Surveys.

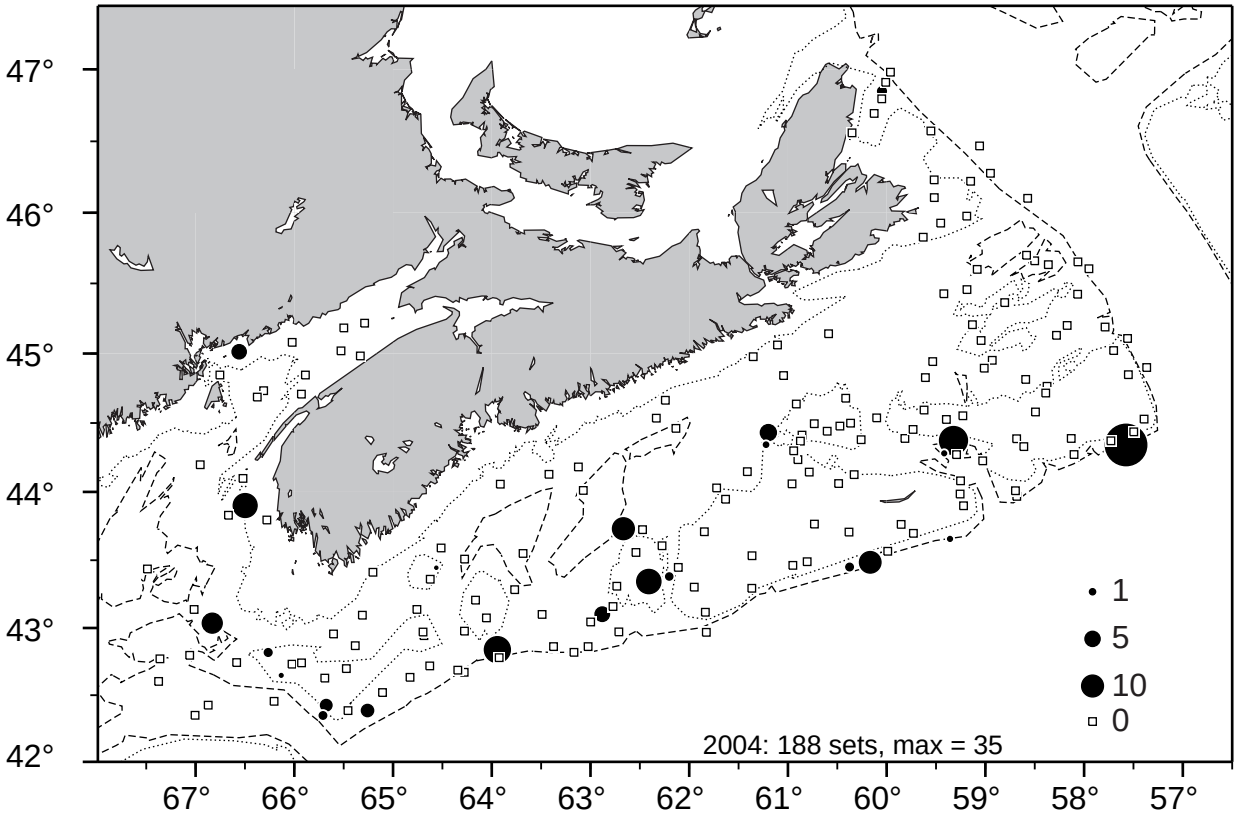

Fig. 68. 4VWX Halibut Biomass (kg/tow) from the 2004 SUMMER Groundfish Survey.

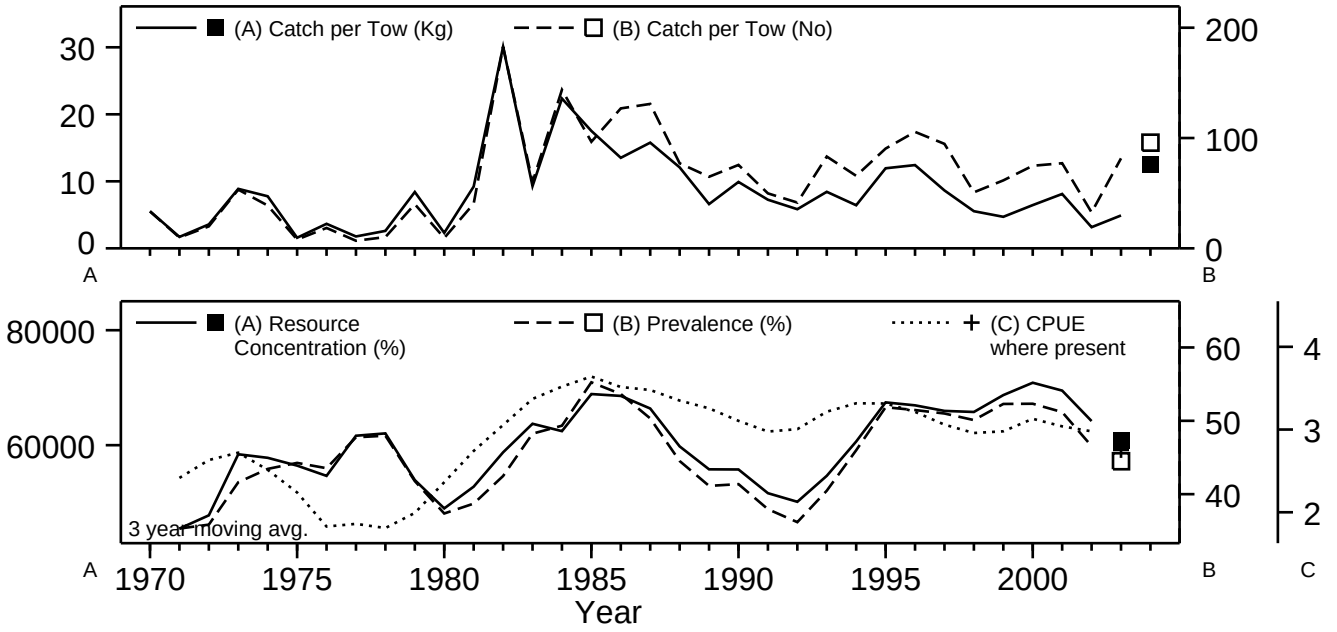

Fig. 69. 4VWX-484/495 Silver Hake stratified mean weight caught per tow, stratified mean number caught per tow, resource concentration, prevalence, CPUE where present (log number/tow) from the SUMMER Groundfish surveys. The catch for 2004 was sampled using the MV Teleost. It has not been calibrated, and should not be compared to the earlier time series.

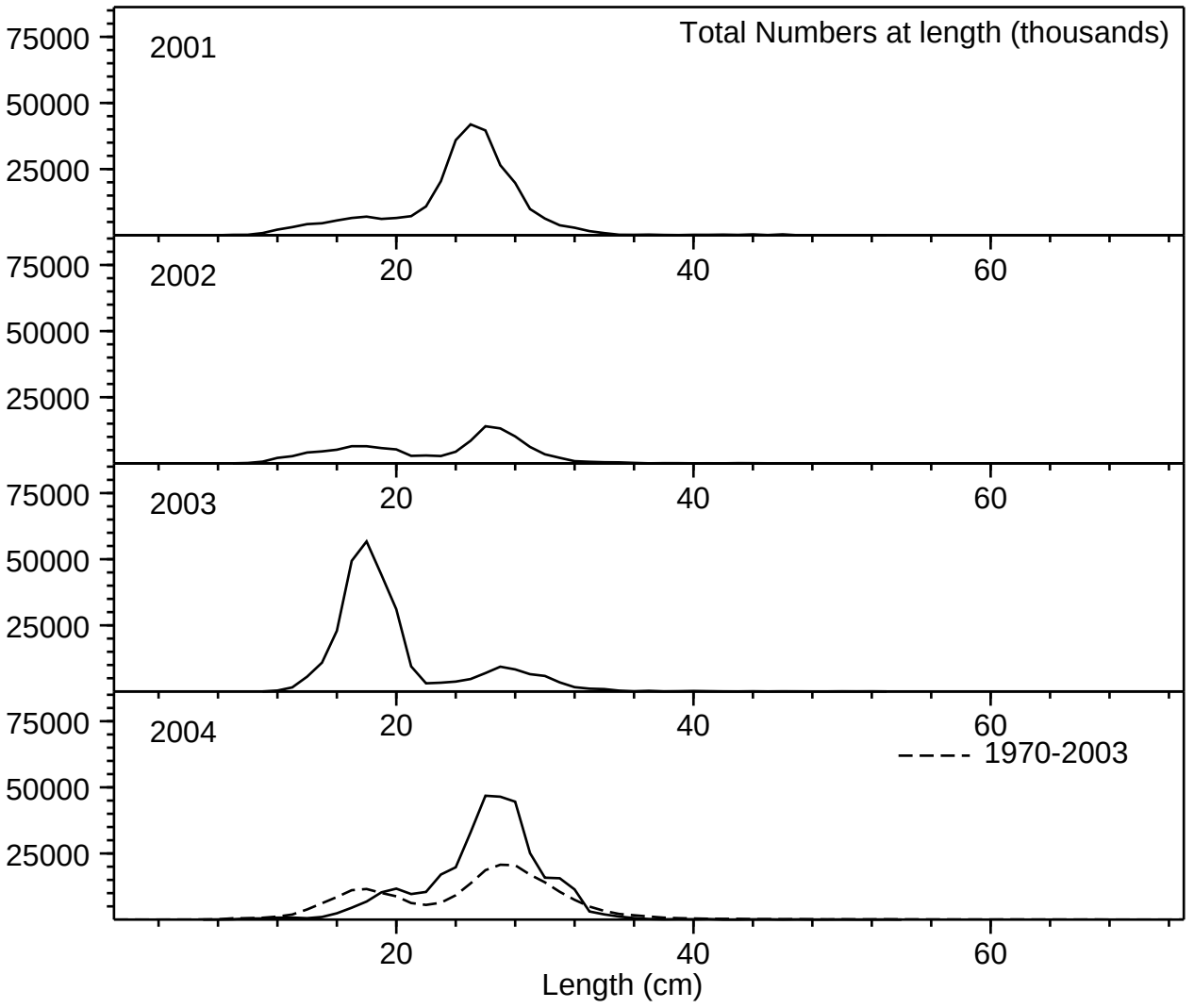

Fig. 70. 4VWX-484/495 Silver Hake length frequency distribution from the SUMMER Groundfish surveys.

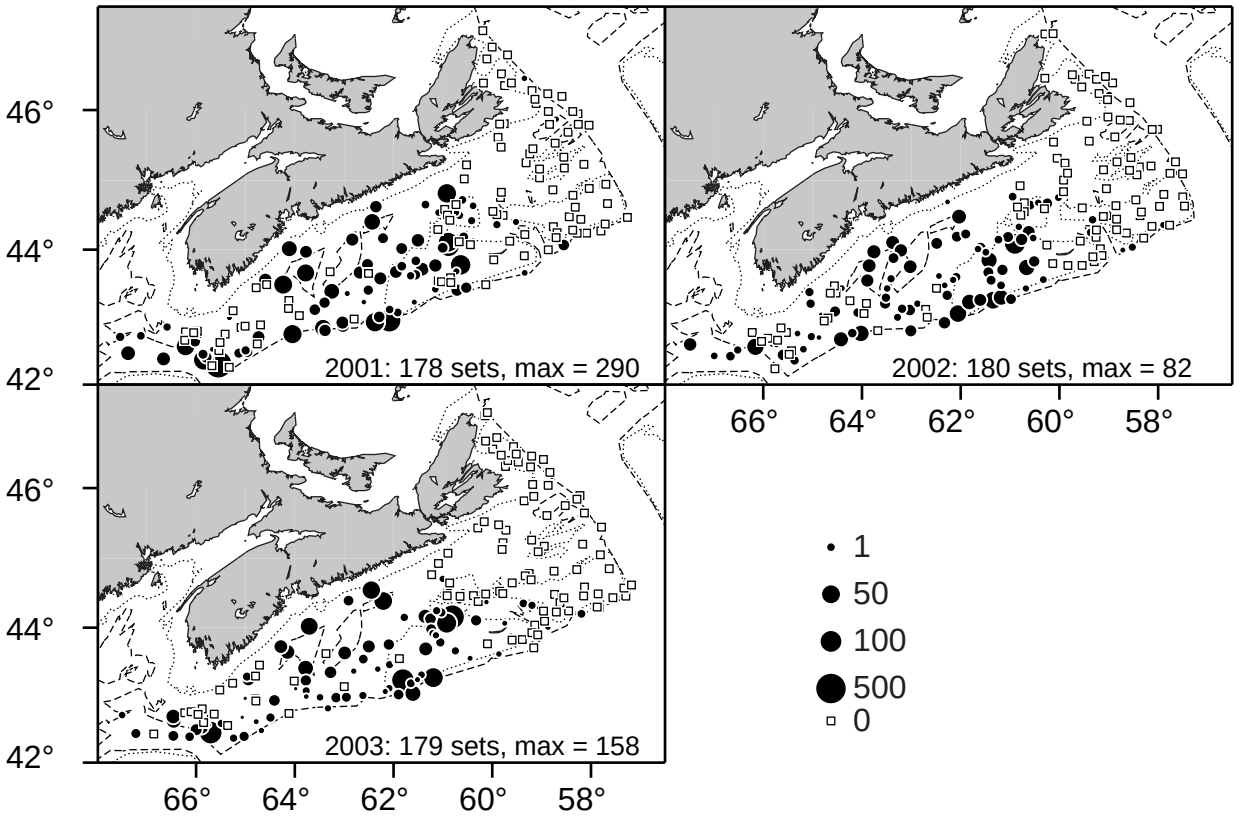

Fig. 71. 4VWX-484/495 Silver Hake Biomass (kg/tow) from the 2001-2003 SUMMER Groundfish Surveys.

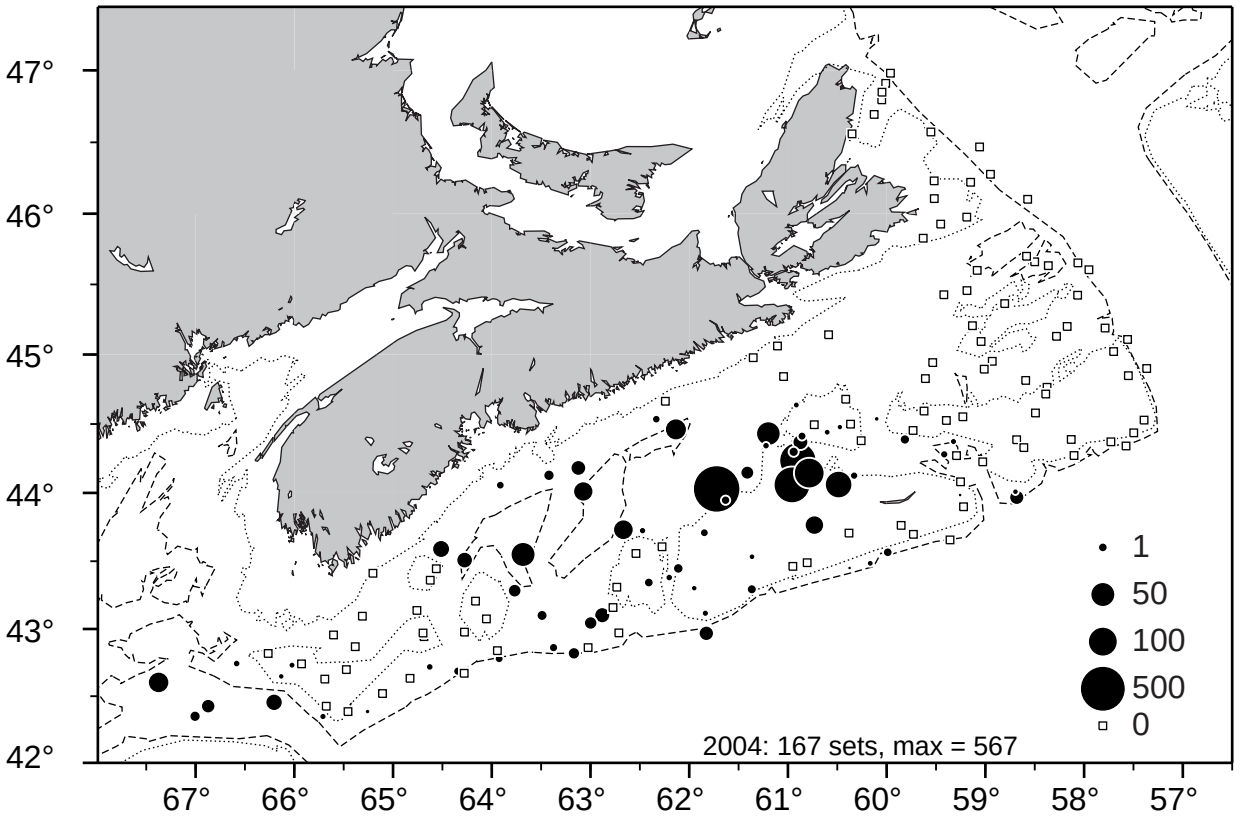

Fig. 72. 4VWX-484/495 Silver Hake Biomass (kg/tow) from the 2004 SUMMER Groundfish Survey.

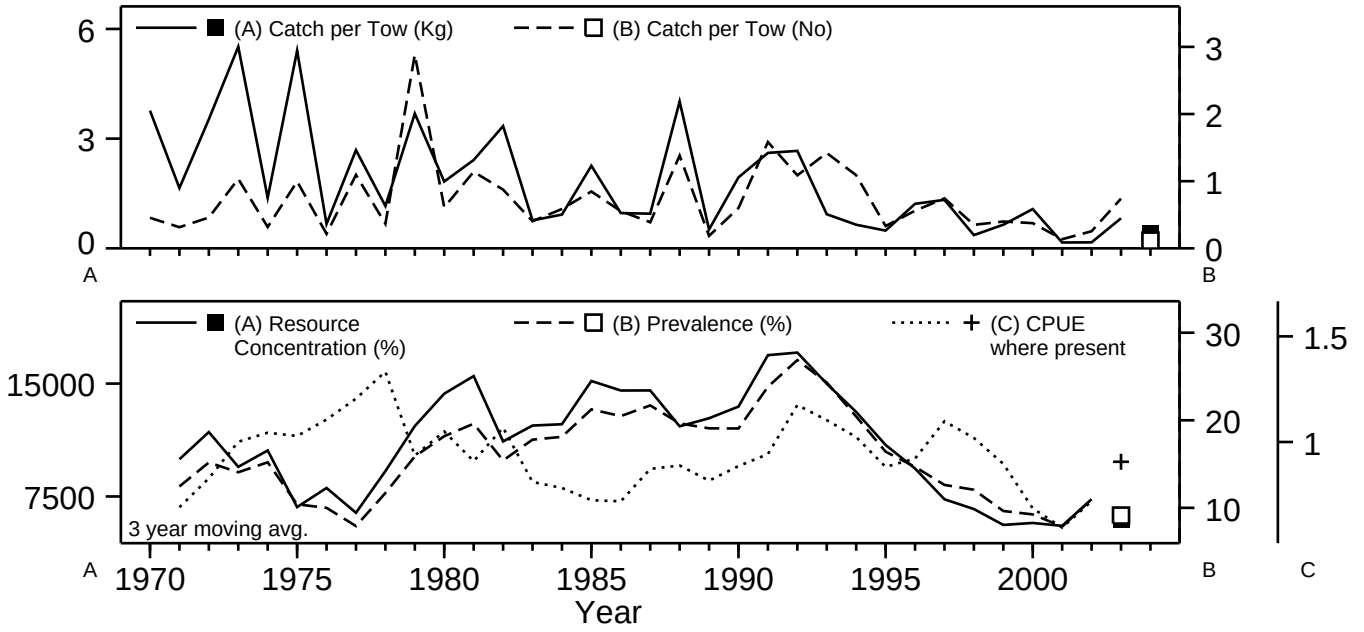

Fig. 73. 4VsW Winter Skate stratified mean weight caught per tow, stratified mean number caught per tow, resource concentration, prevalence, CPUE where present (log number/tow) from the SUMMER Groundfish surveys. The catch for 2004 was sampled using the MV Teleost. It has not been calibrated, and should not be compared to the earlier time series.

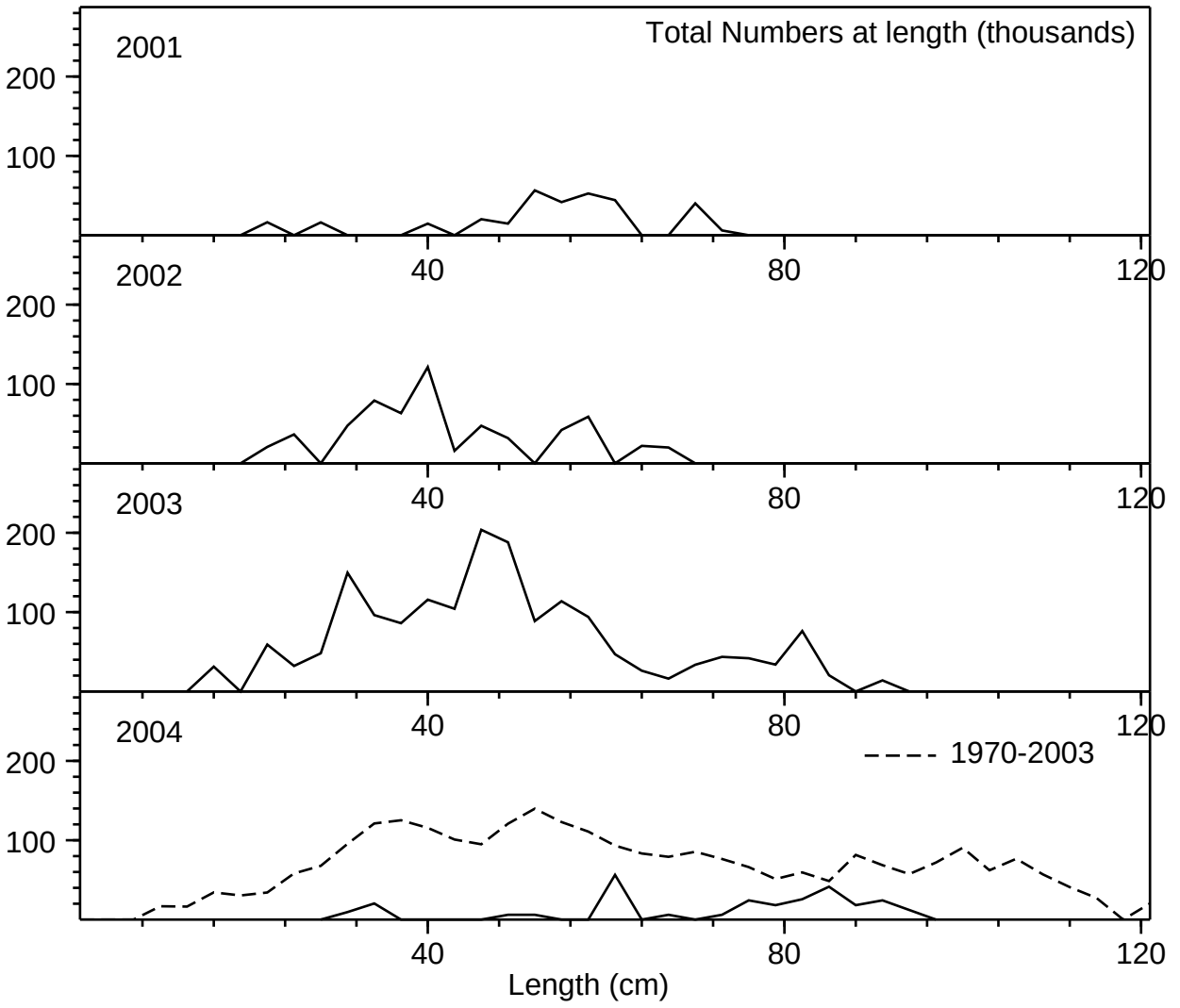

Fig. 74. 4VsW Winter Skate length frequency distribution from the SUMMER Groundfish surveys.

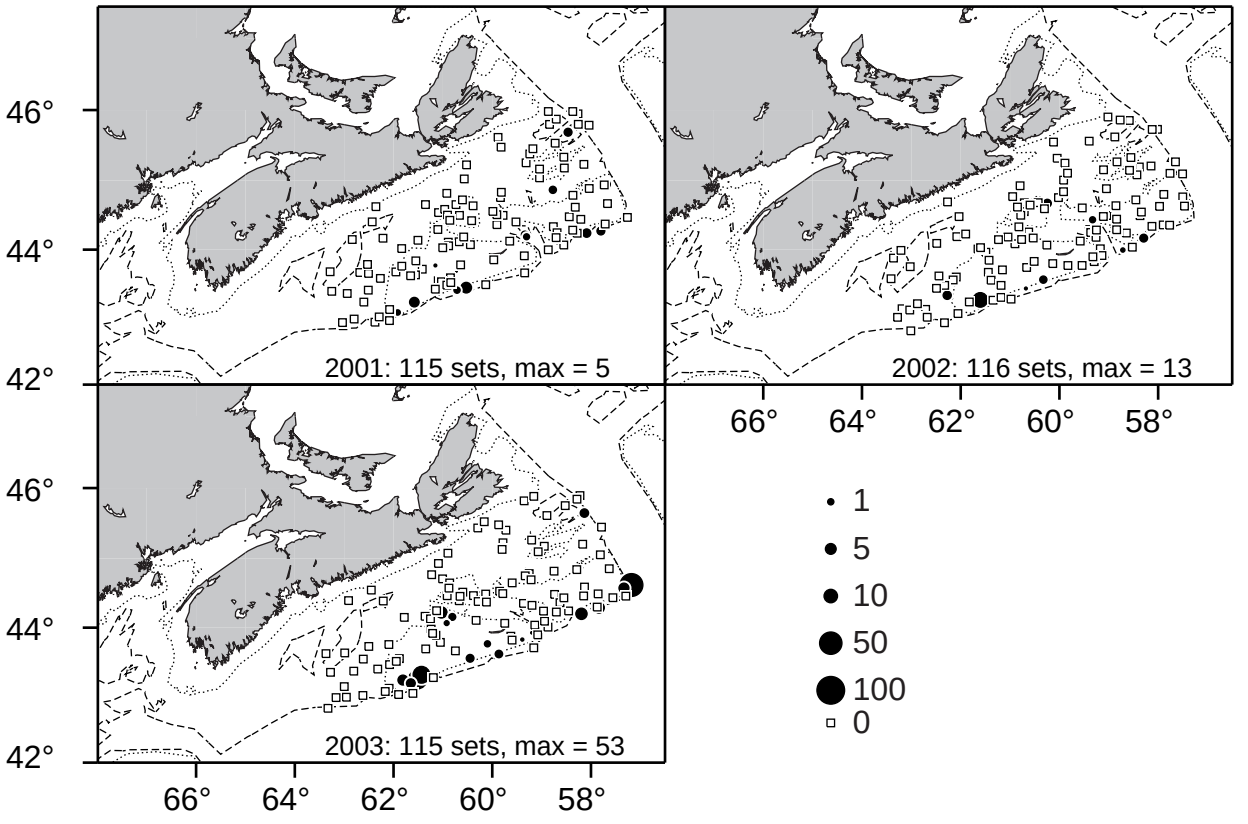

Fig. 75. 4VsW Winter Skate Biomass (kg/tow) from the 2001-2003 SUMMER Groundfish Surveys.

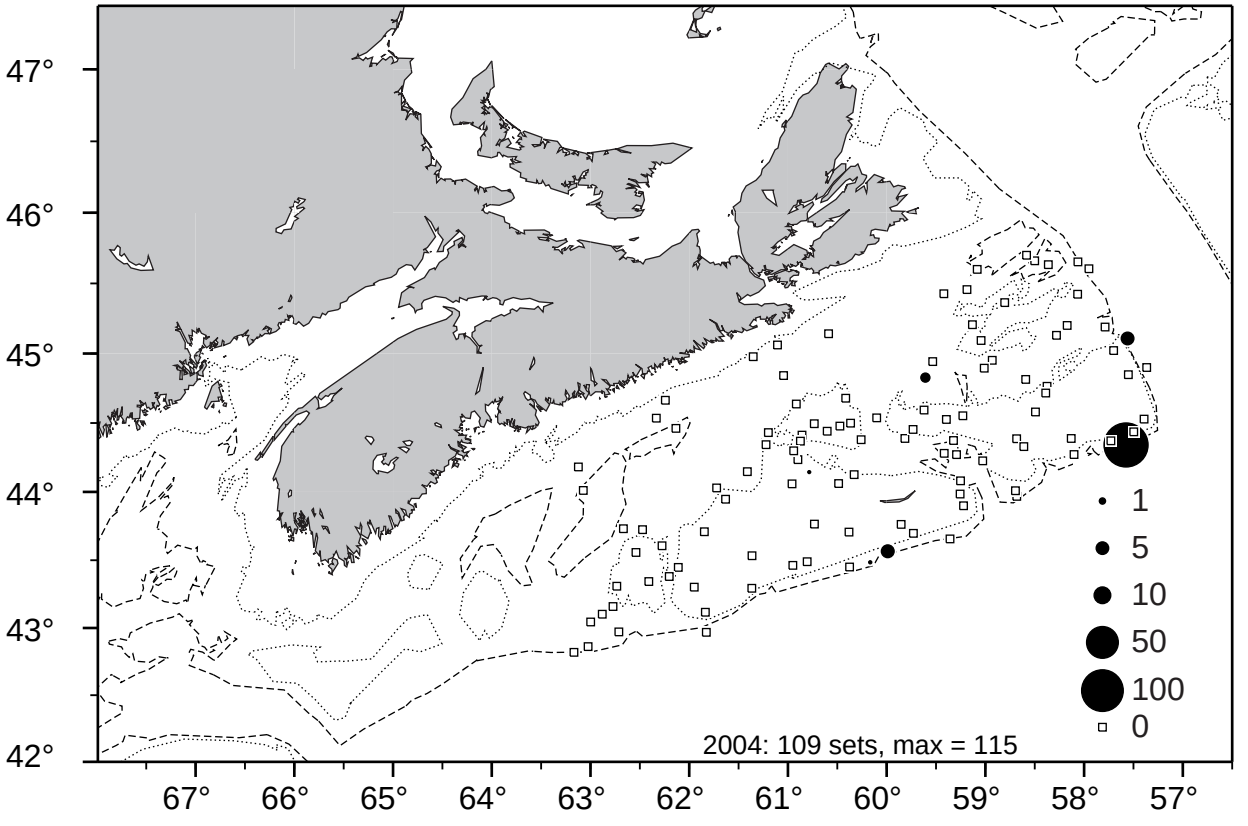

Fig. 76. 4VsW Winter Skate Biomass (kg/tow) from the 2004 SUMMER Groundfish Survey.

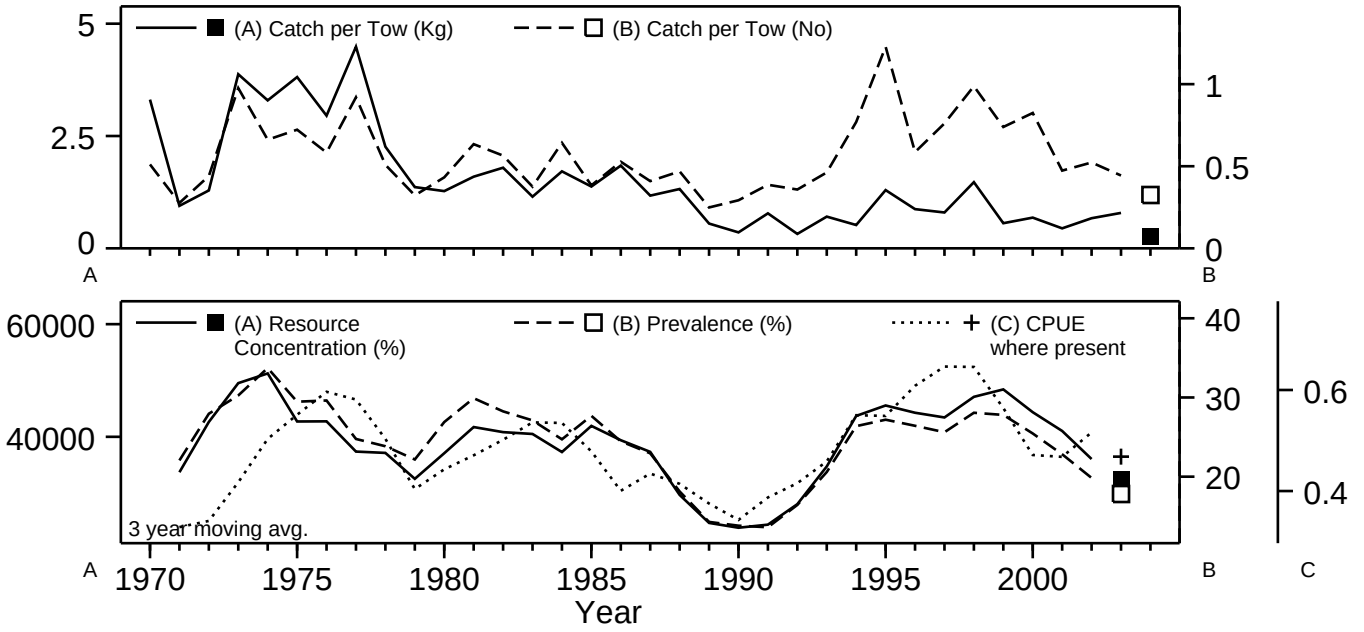

Fig. 77. 4VWX Monkfish stratified mean weight caught per tow, stratified mean number caught per tow, resource concentration, prevalence, CPUE where present (log number/tow) from the SUMMER Groundfish surveys. The catch for 2004 was sampled using the MV Teleost. It has not been calibrated, and should not be compared to the earlier time series.

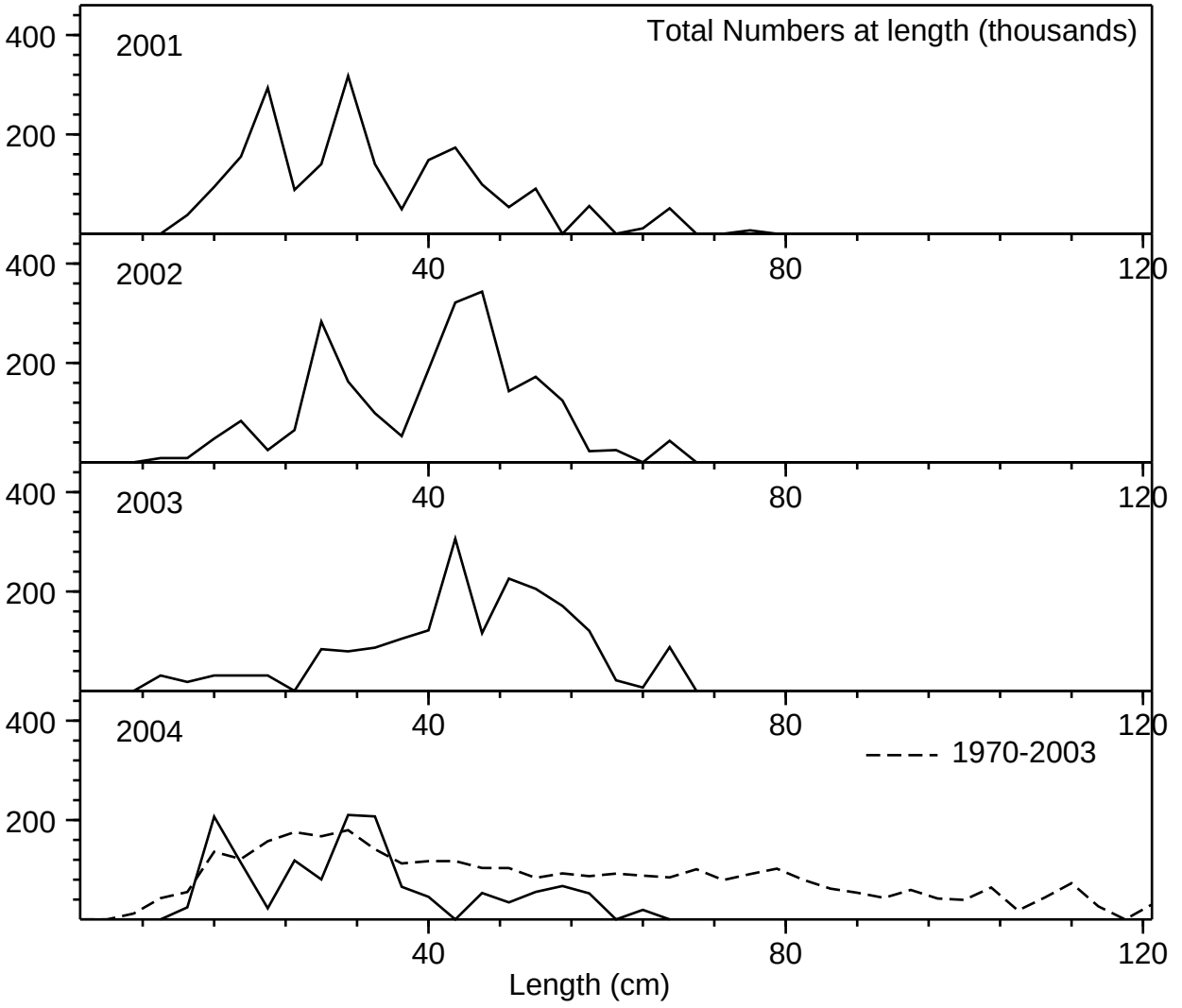

Fig. 78. 4VWX Monkfish length frequency distribution from the SUMMER Groundfish surveys.

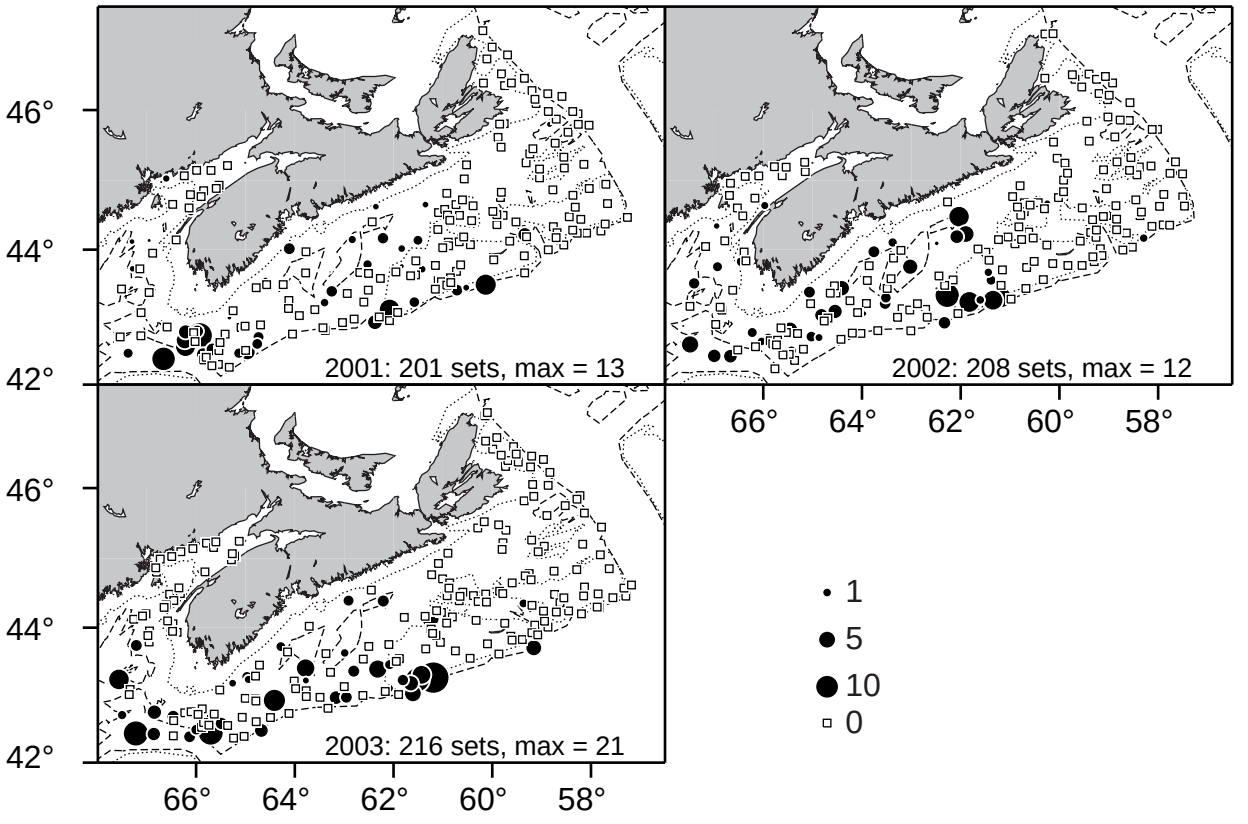

Fig. 79. 4VWX Monkfish Biomass (kg/tow) from the 2001-2003 SUMMER Groundfish Surveys.

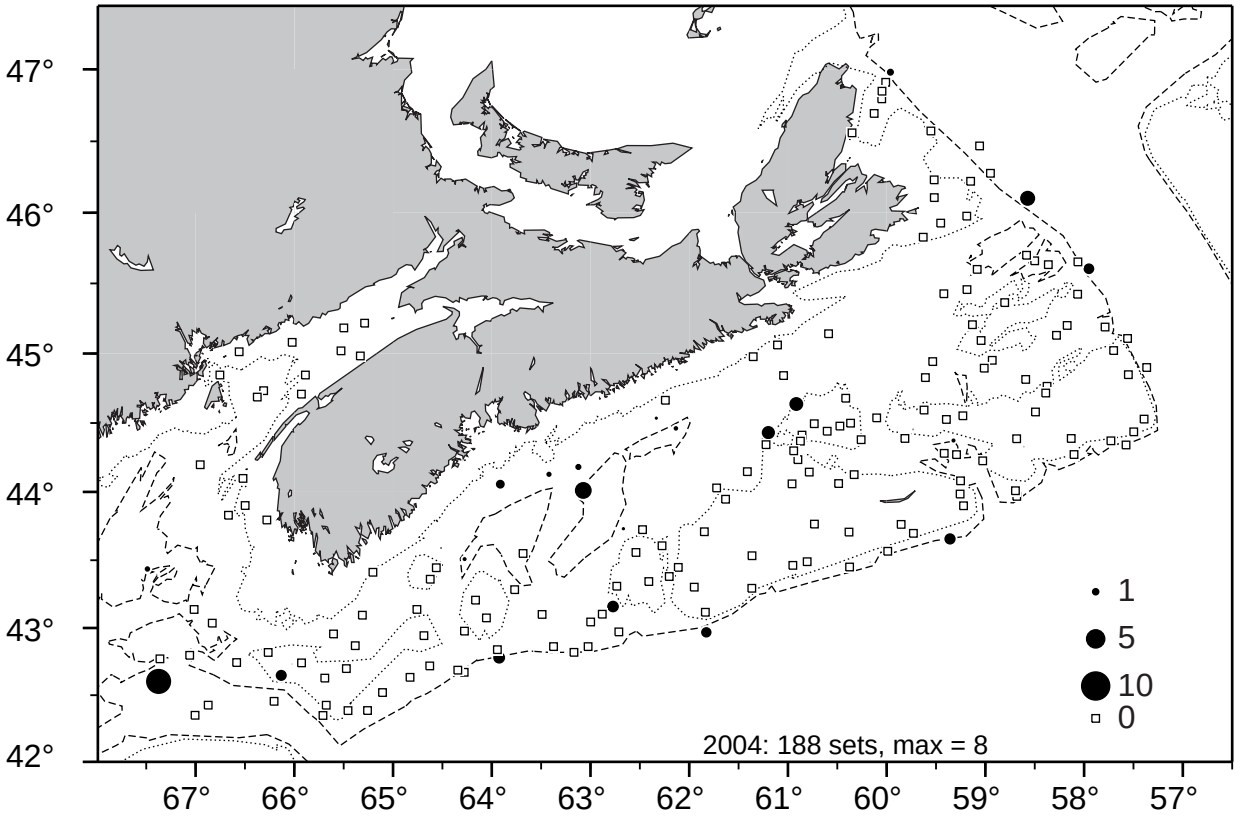

Fig. 80. 4VWX Monkfish Biomass (kg/tow) from the 2004 SUMMER Groundfish Survey.

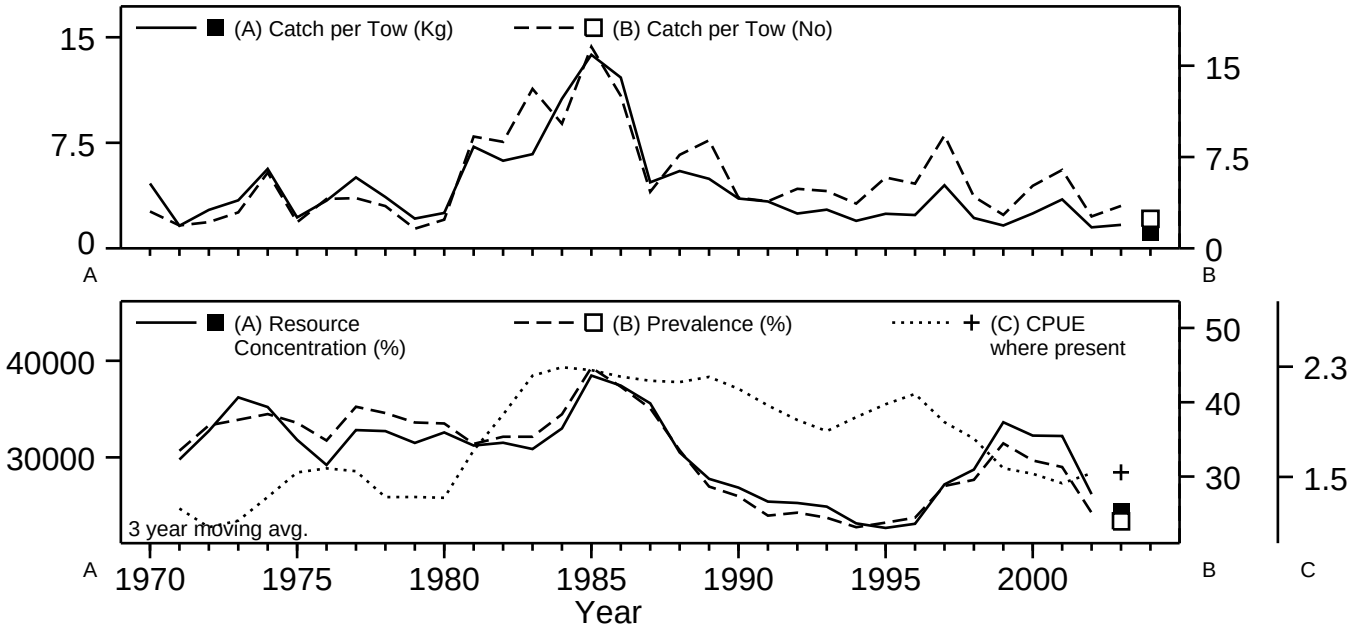

Fig. 81. 4VW White Hake stratified mean weight caught per tow, stratified mean number caught per tow, resource concentration, prevalence, CPUE where present (log number/tow) from the SUMMER Groundfish surveys. The catch for 2004 was sampled using the MV Teleost. It has not been calibrated, and should not be compared to the earlier time series.

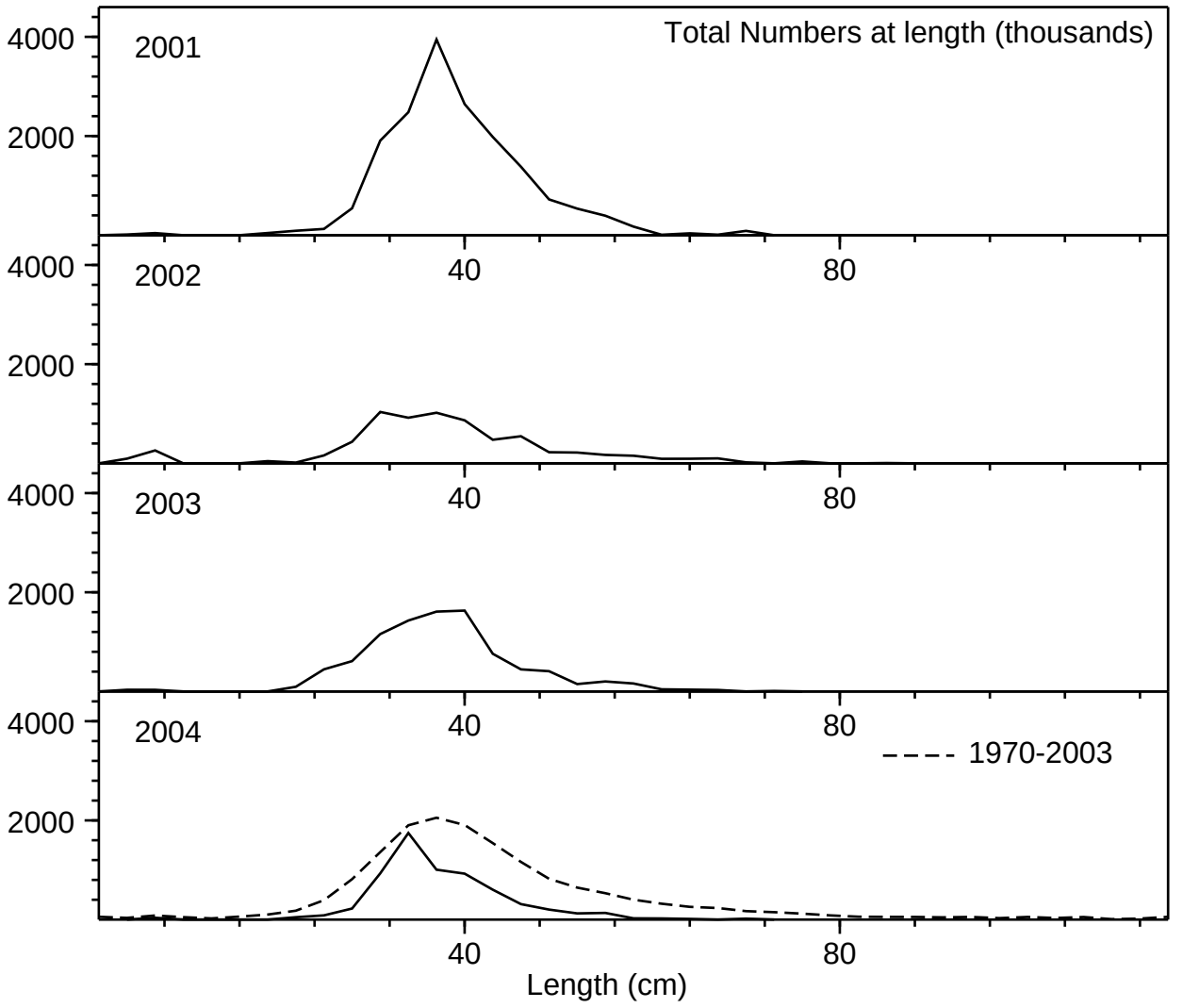

Fig. 82. 4VW White Hake length frequency distribution from the SUMMER Groundfish surveys.

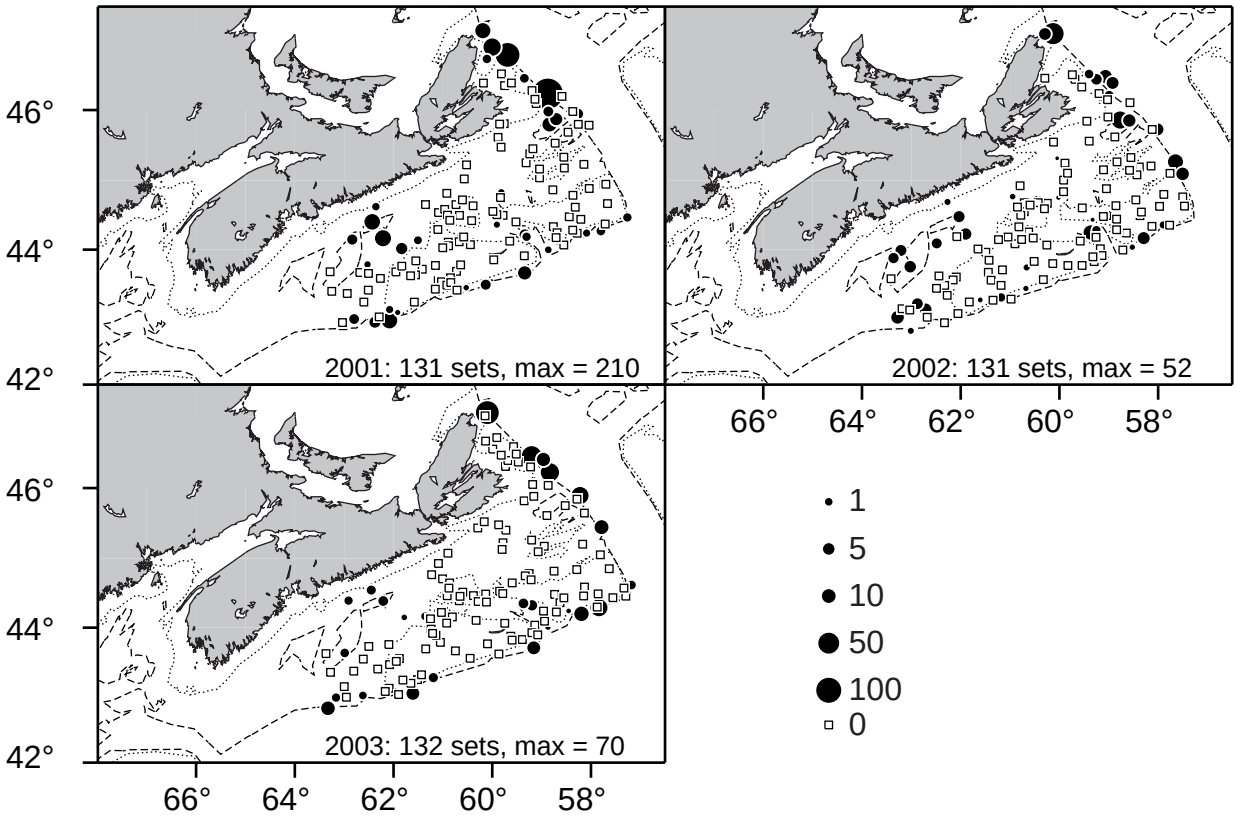

Fig. 83. 4VW White Hake Biomass (kg/tow) from the 2001-2003 SUMMER Groundfish Surveys.

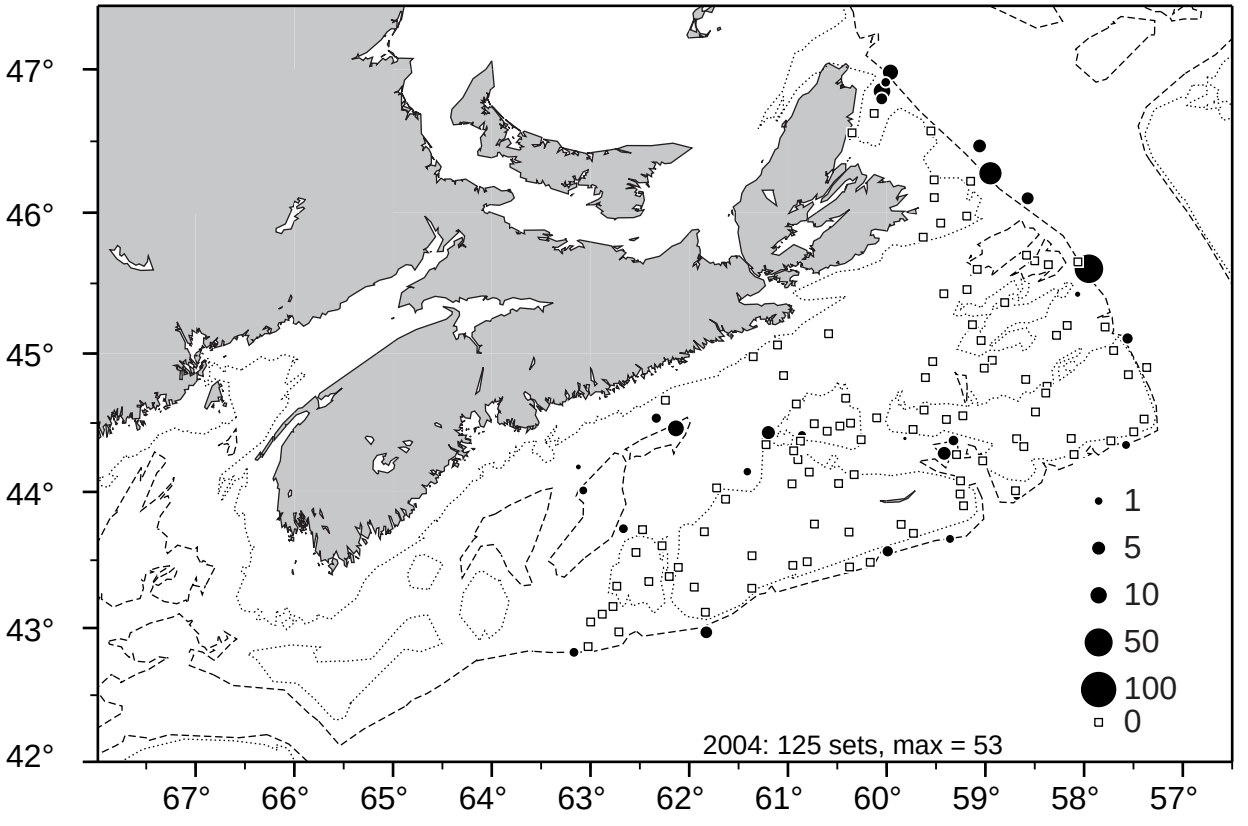

Fig. 84. 4VW White Hake Biomass (kg/tow) from the 2004 SUMMER Groundfish Survey.

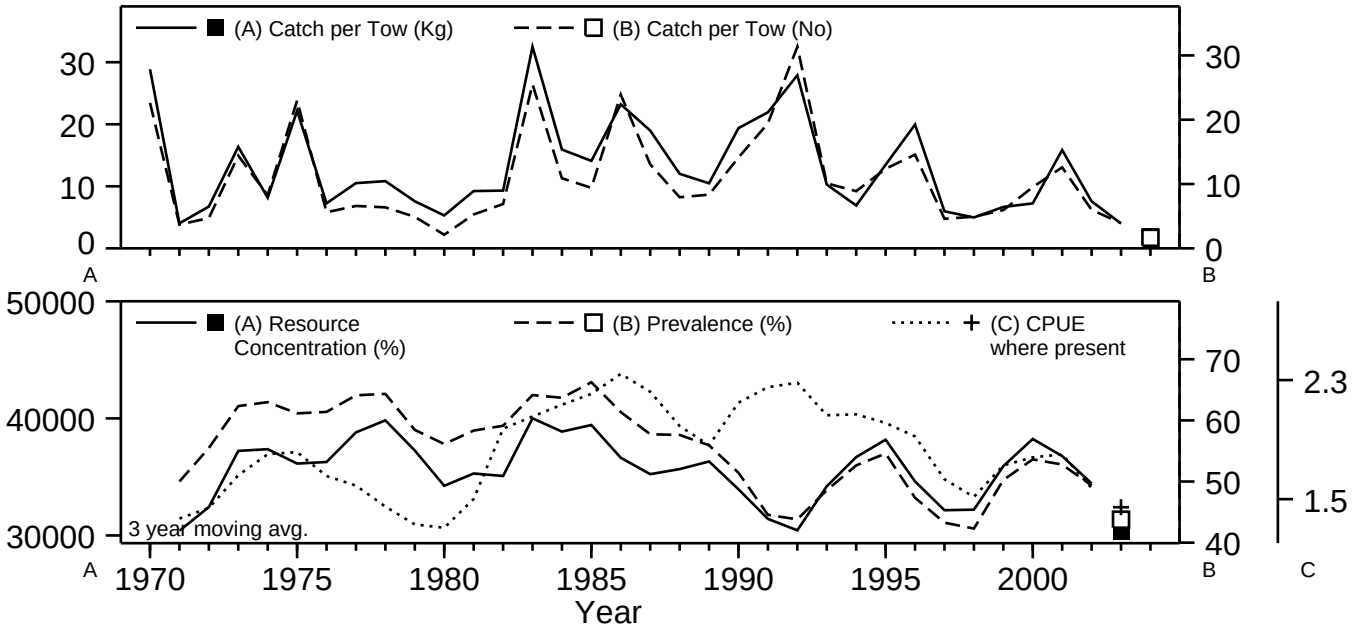

Fig. 85. 4X White Hake stratified mean weight caught per tow, stratified mean number caught per tow, resource concentration, prevalence, CPUE where present (log number/tow) from the SUMMER Groundfish surveys. The catch for 2004 was sampled using the MV Teleost. It has not been calibrated, and should not be compared to the earlier time series.

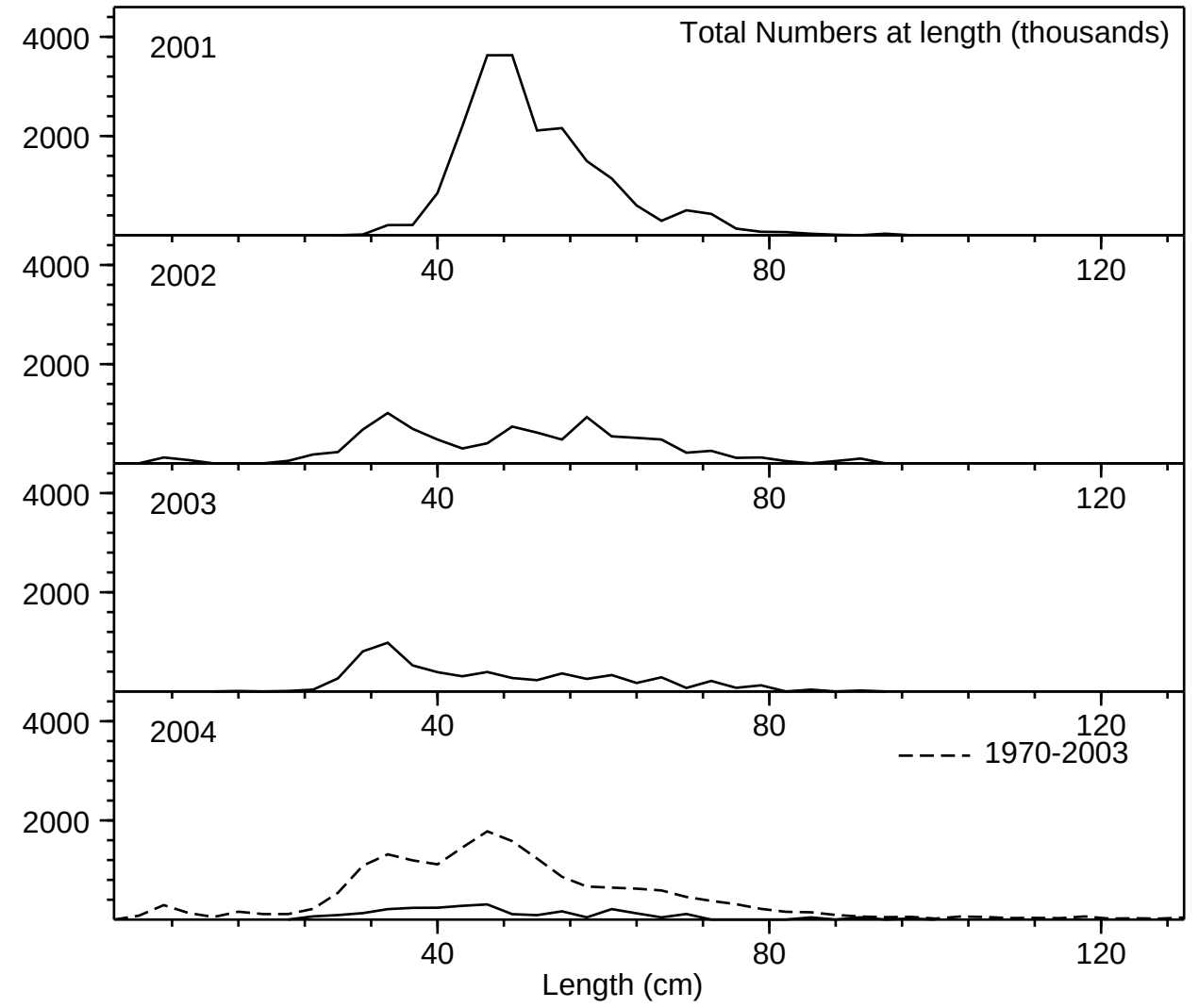

Fig. 86. 4X White Hake length frequency distribution from the SUMMER Groundfish surveys.

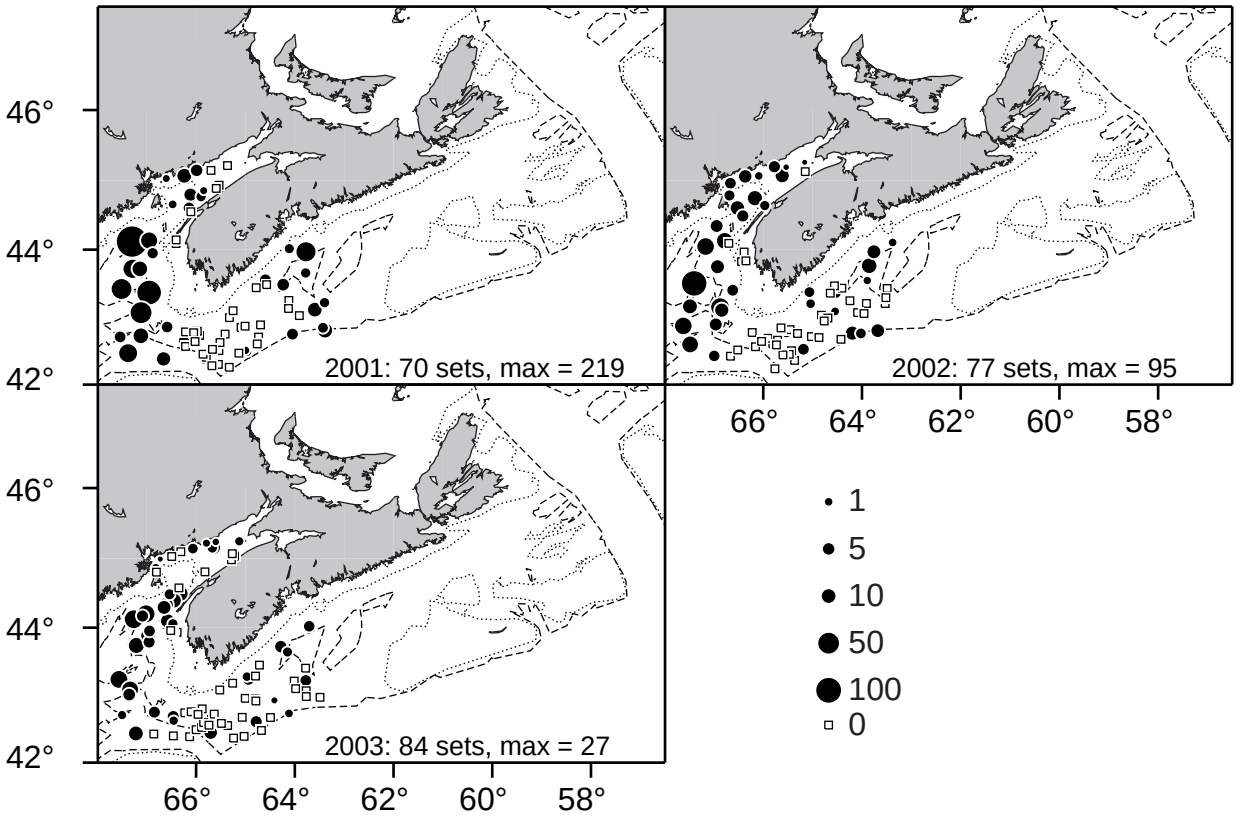

Fig. 87. 4X White Hake Biomass (kg/tow) from the 2001-2003 SUMMER Groundfish Surveys.

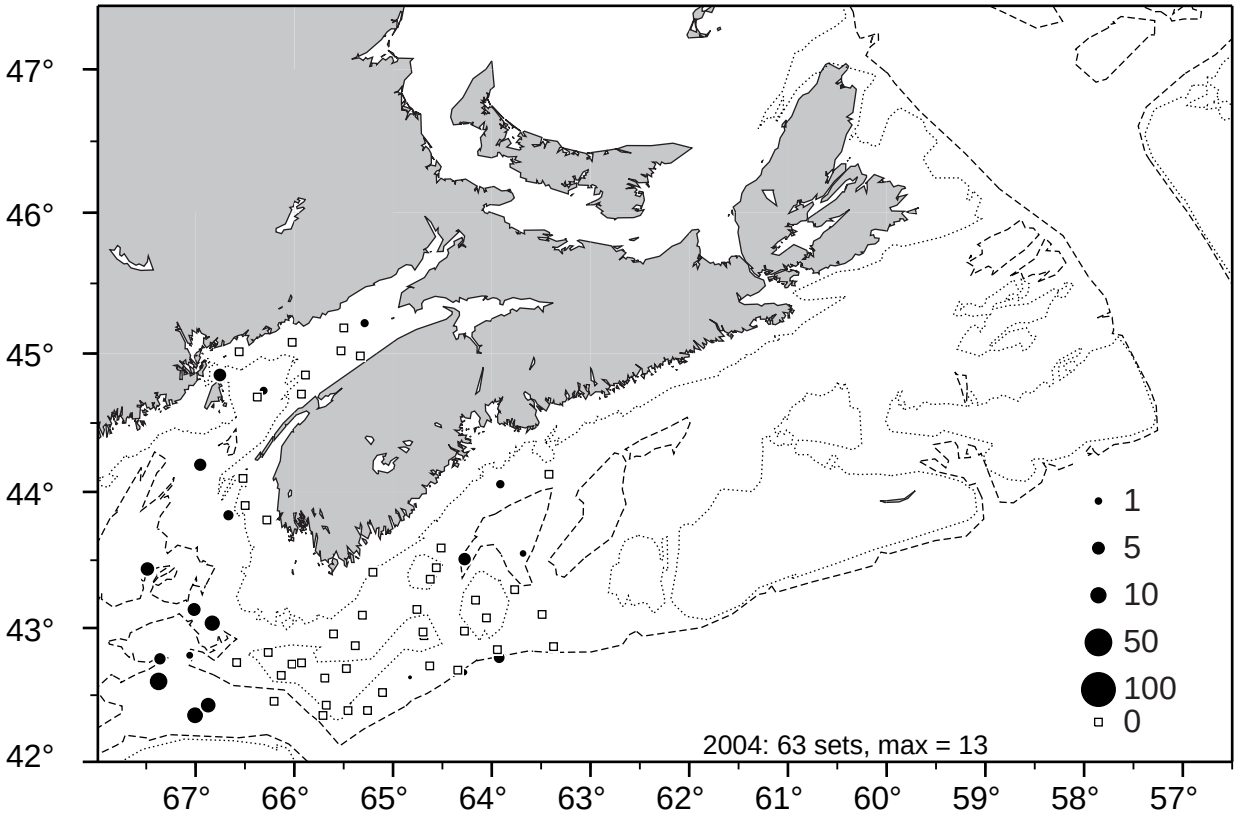

Fig. 88. 4X White Hake Biomass (kg/tow) from the 2004 SUMMER Groundfish Survey.

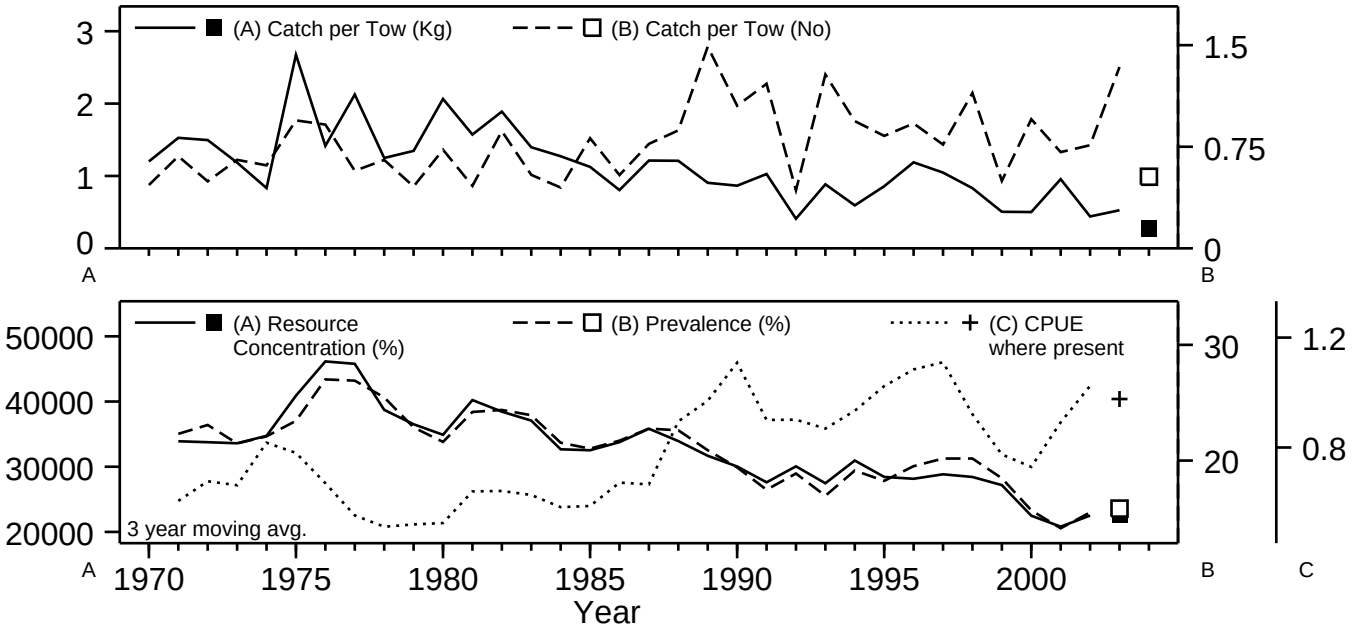

Fig. 89. 4VWX Striped Atlantic Wolffish stratified mean weight caught per tow, stratified mean number caught per tow, resource concentration, prevalence, CPUE where present (log number/tow) from the SUMMER Groundfish surveys. The catch for 2004 was sampled using the MV Teleost. It has not been calibrated, and should not be compared to the earlier time series.

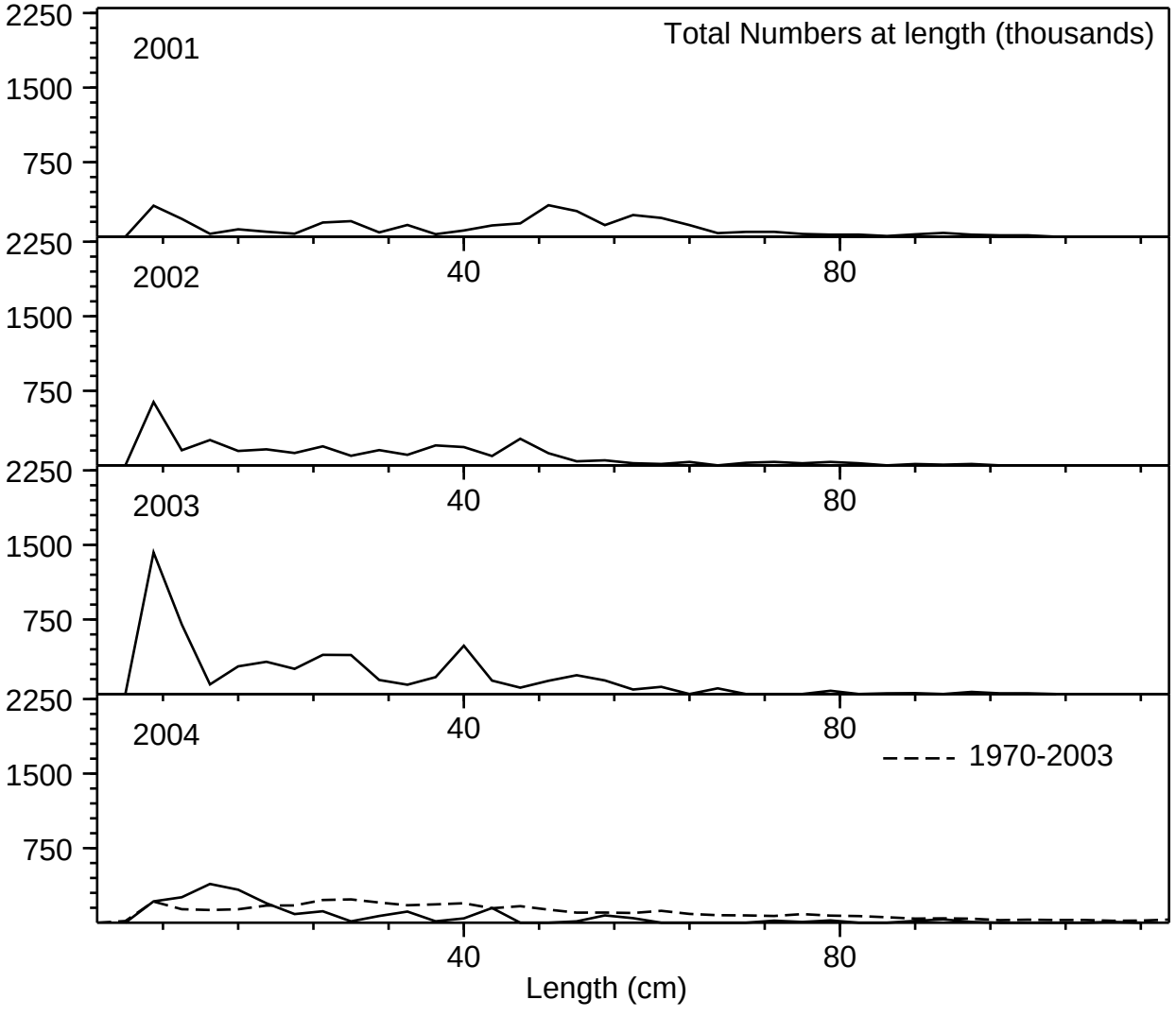

Fig. 90. 4VWX Striped Atlantic Wolffish length frequency distribution from the SUMMER Groundfish surveys.

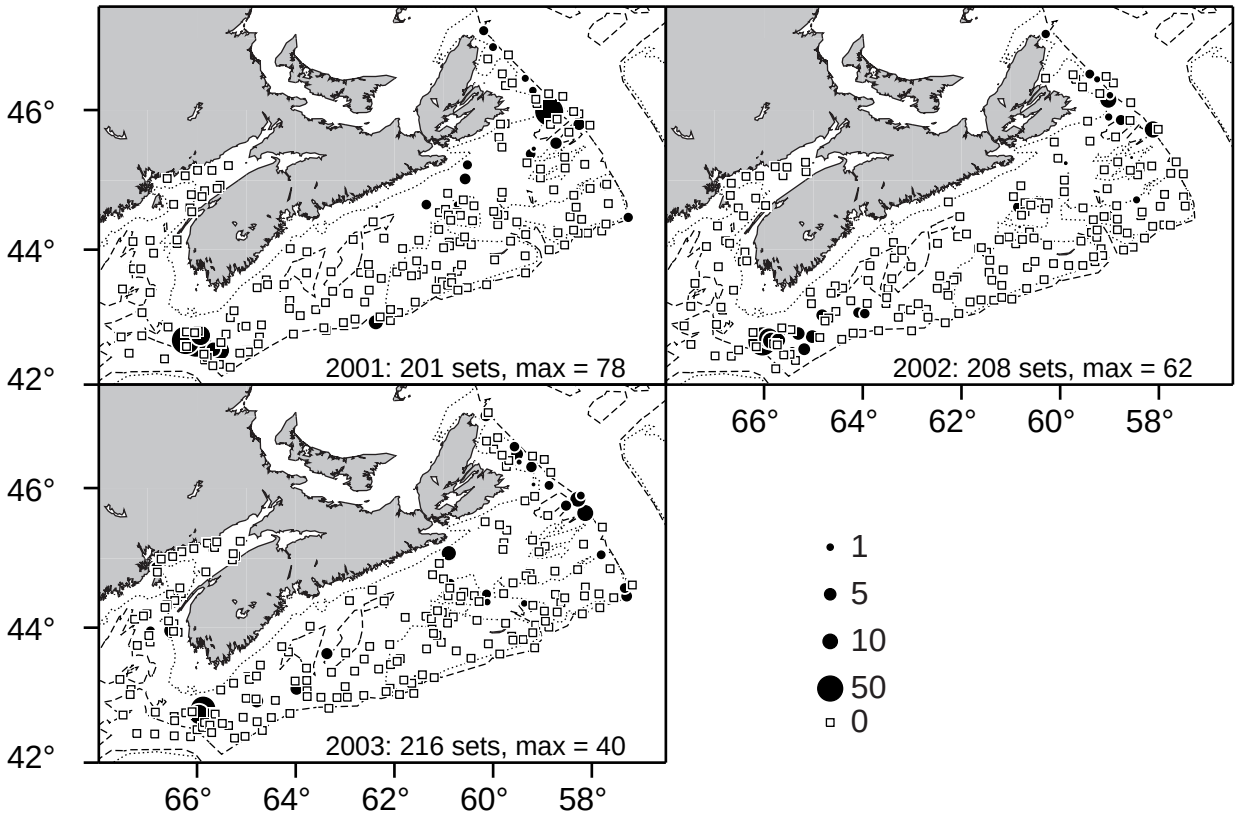

Fig. 91. 4VWX Striped Atlantic Wolffish Biomass (kg/tow) from the 2001-2003 SUMMER Groundfish Surveys.

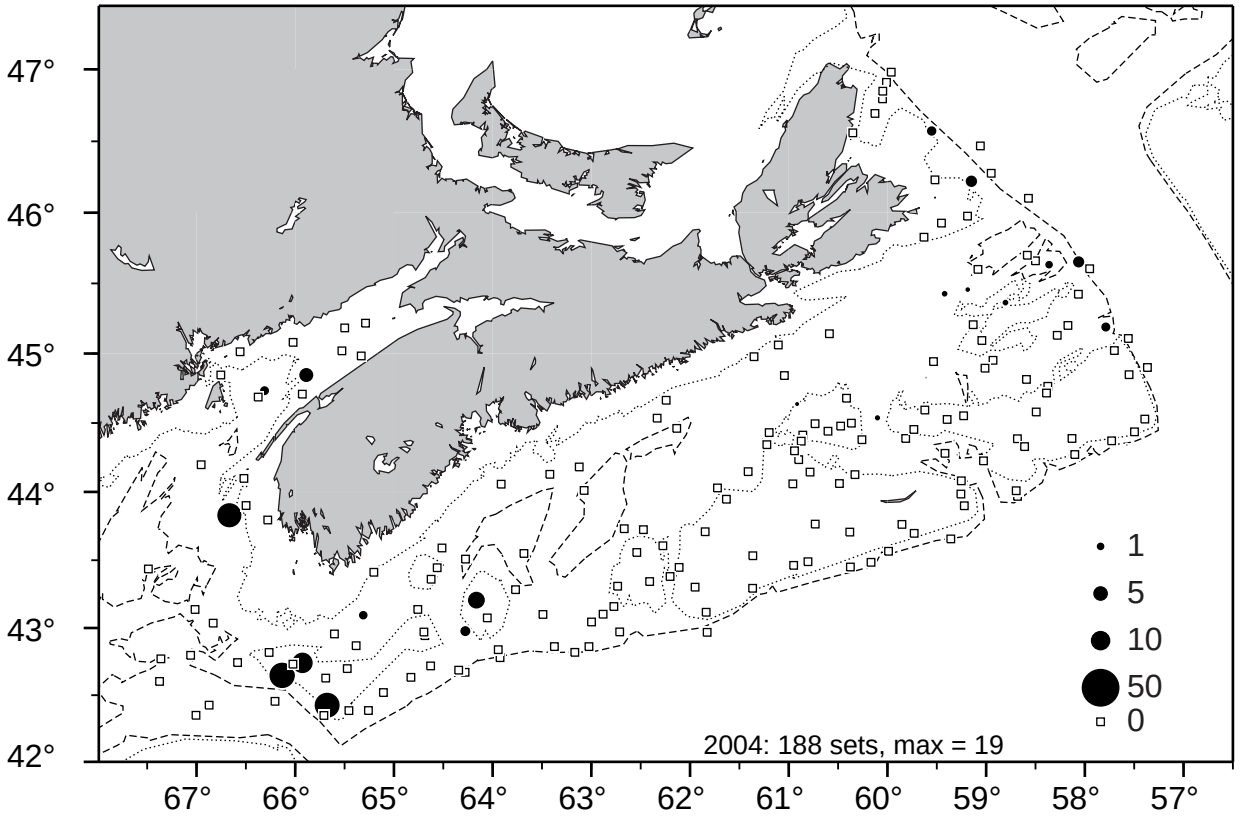

Fig. 92. 4VWX Striped Atlantic Wolffish Biomass (kg/tow) from the 2004 SUMMER Groundfish Survey.

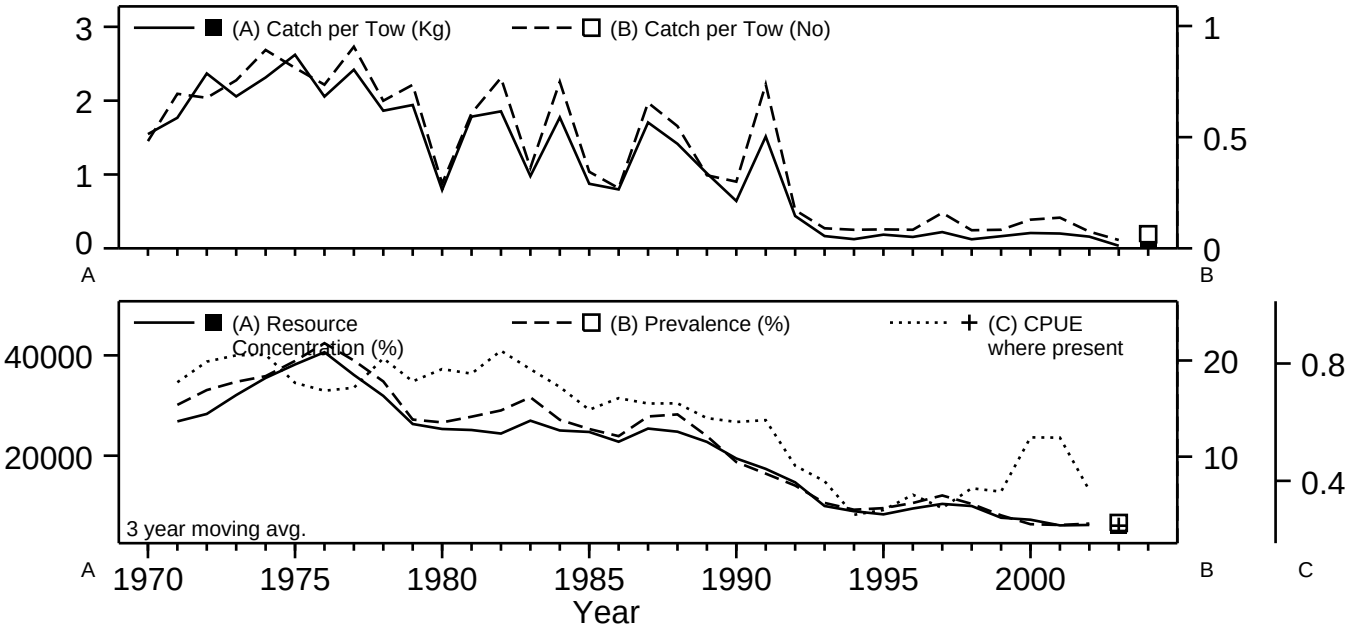

Fig. 93. 4VWX Cusk stratified mean weight caught per tow, stratified mean number caught per tow, resource concentration, prevalence, CPUE where present (log number/tow) from the SUMMER Groundfish surveys. The catch for 2004 was sampled using the MV Teleost. It has not been calibrated, and should not be compared to the earlier time series.

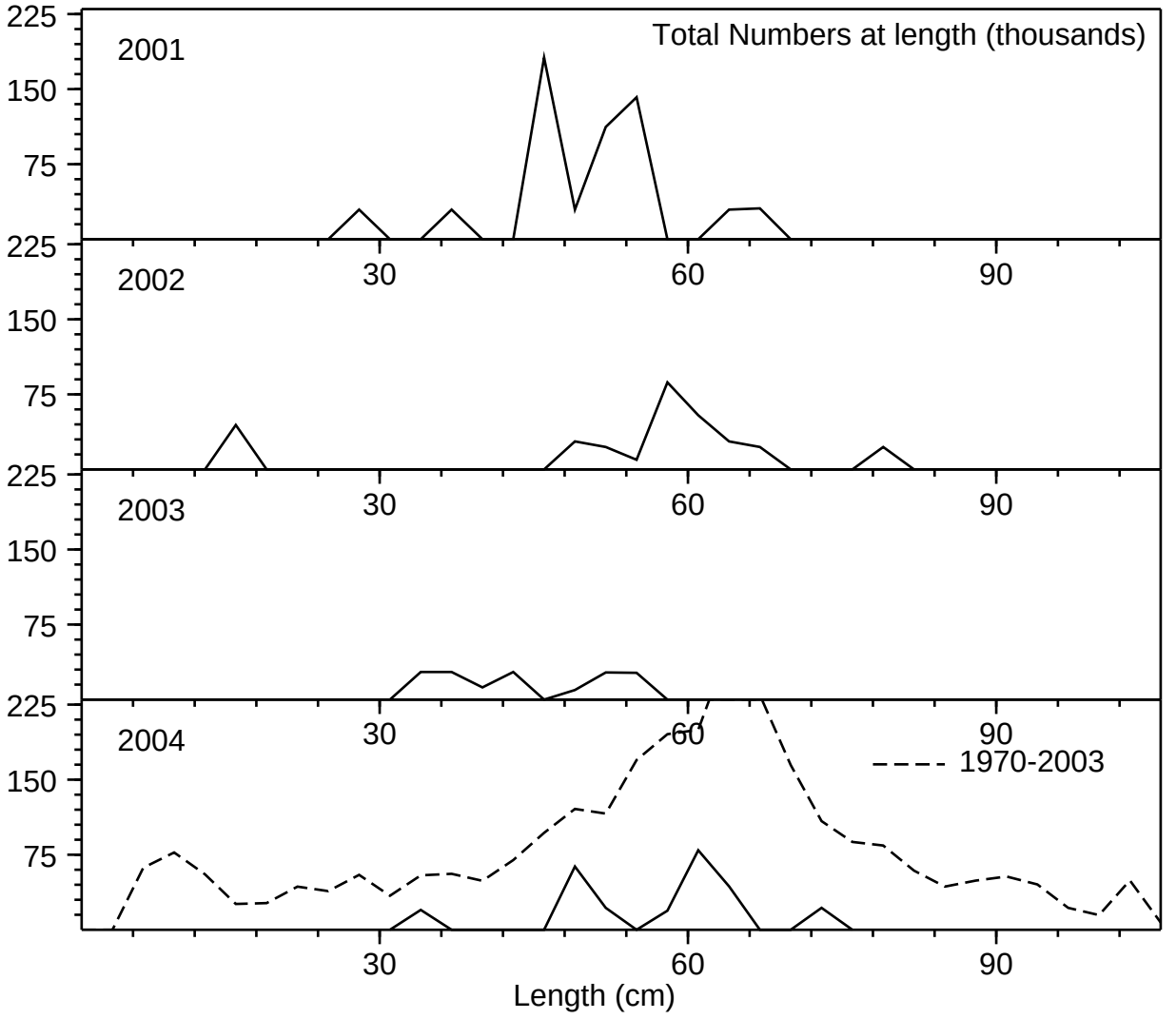

Fig. 94. 4VWX Cusk length frequency distribution from the SUMMER Groundfish surveys.

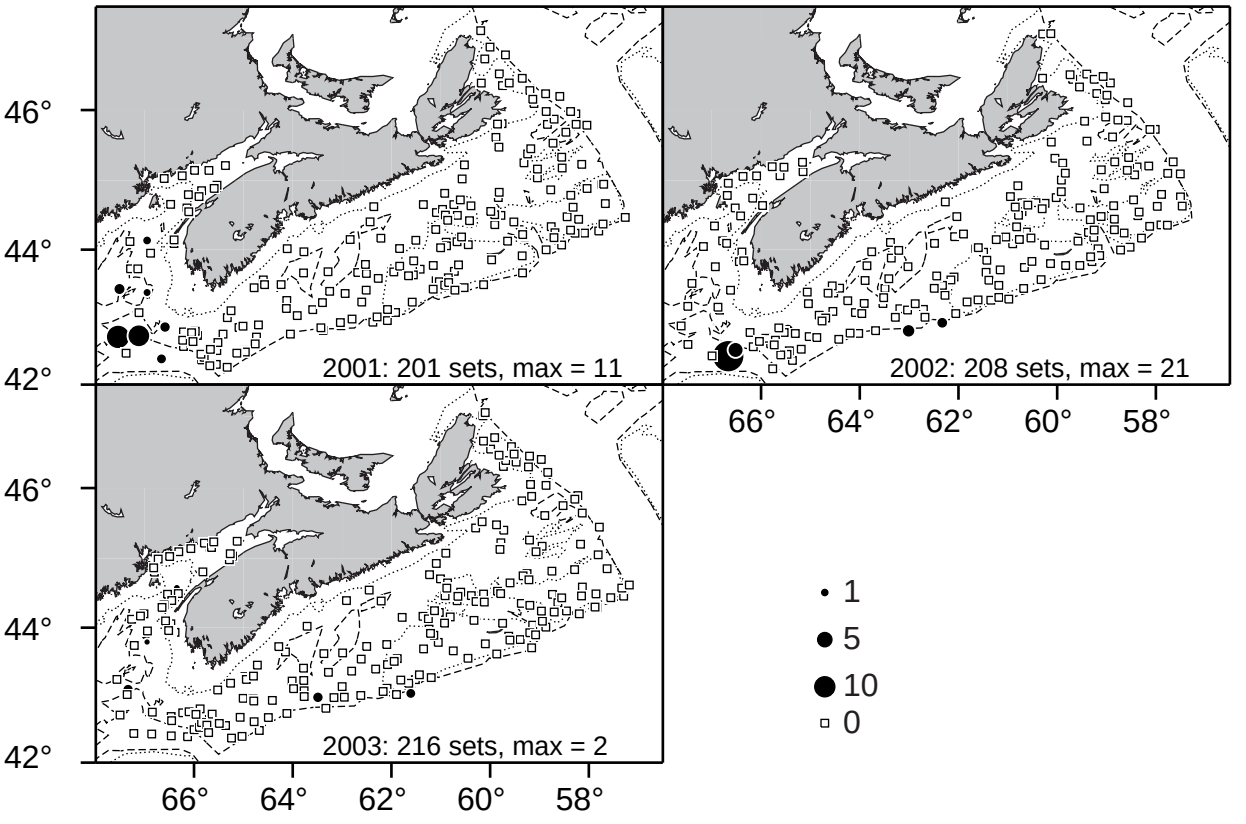

Fig. 95. 4VWX Cusk Biomass (kg/tow) from the 2001-2003 SUMMER Groundfish Surveys.

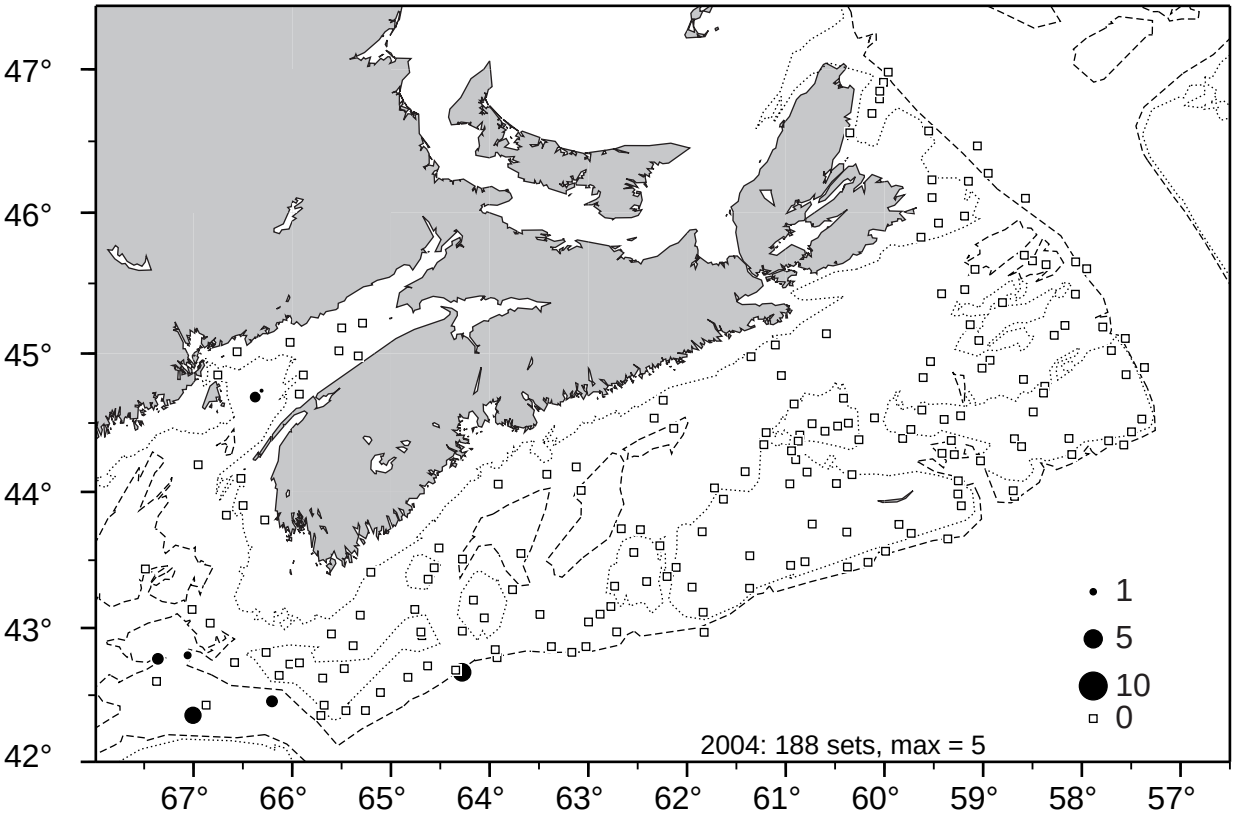

Fig. 96. 4VWX Cusk Biomass (kg/tow) from the 2004 SUMMER Groundfish Survey.

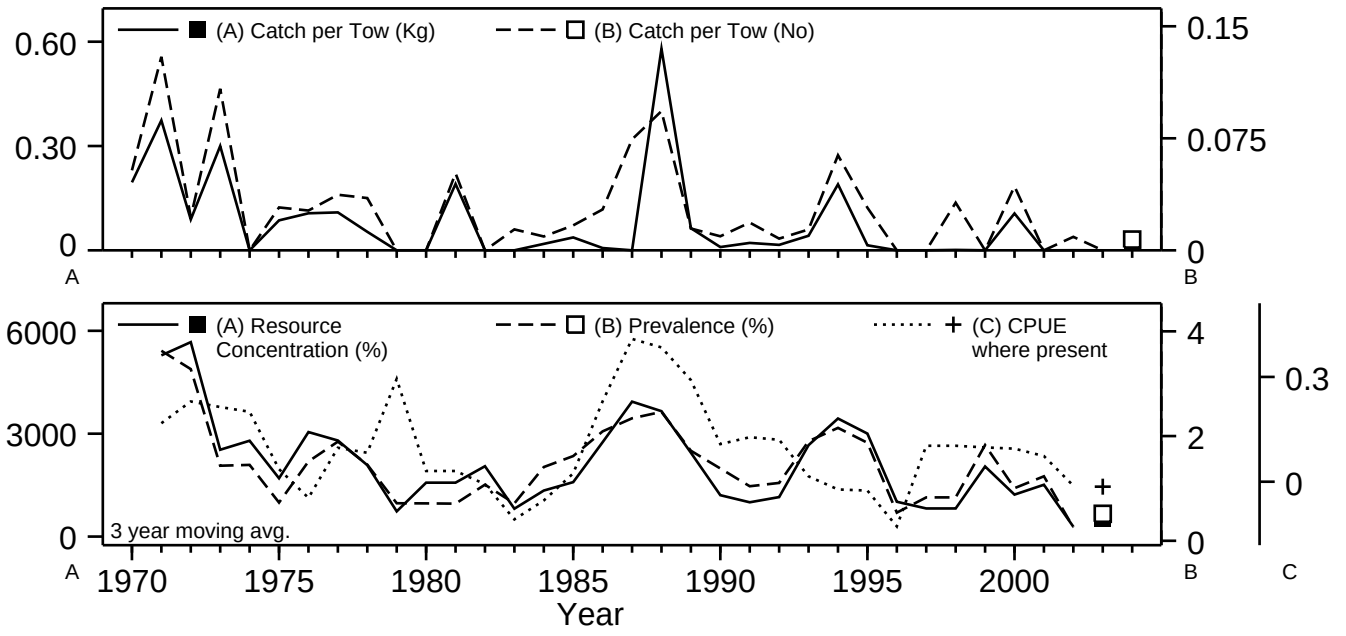

Fig. 97. 4VW Lumpfish stratified mean weight caught per tow, stratified mean number caught per tow, resource concentration, prevalence, CPUE where present (log number/tow) from the SUMMER Groundfish surveys. The catch for 2004 was sampled using the MV Teleost. It has not been calibrated, and should not be compared to the earlier time series.

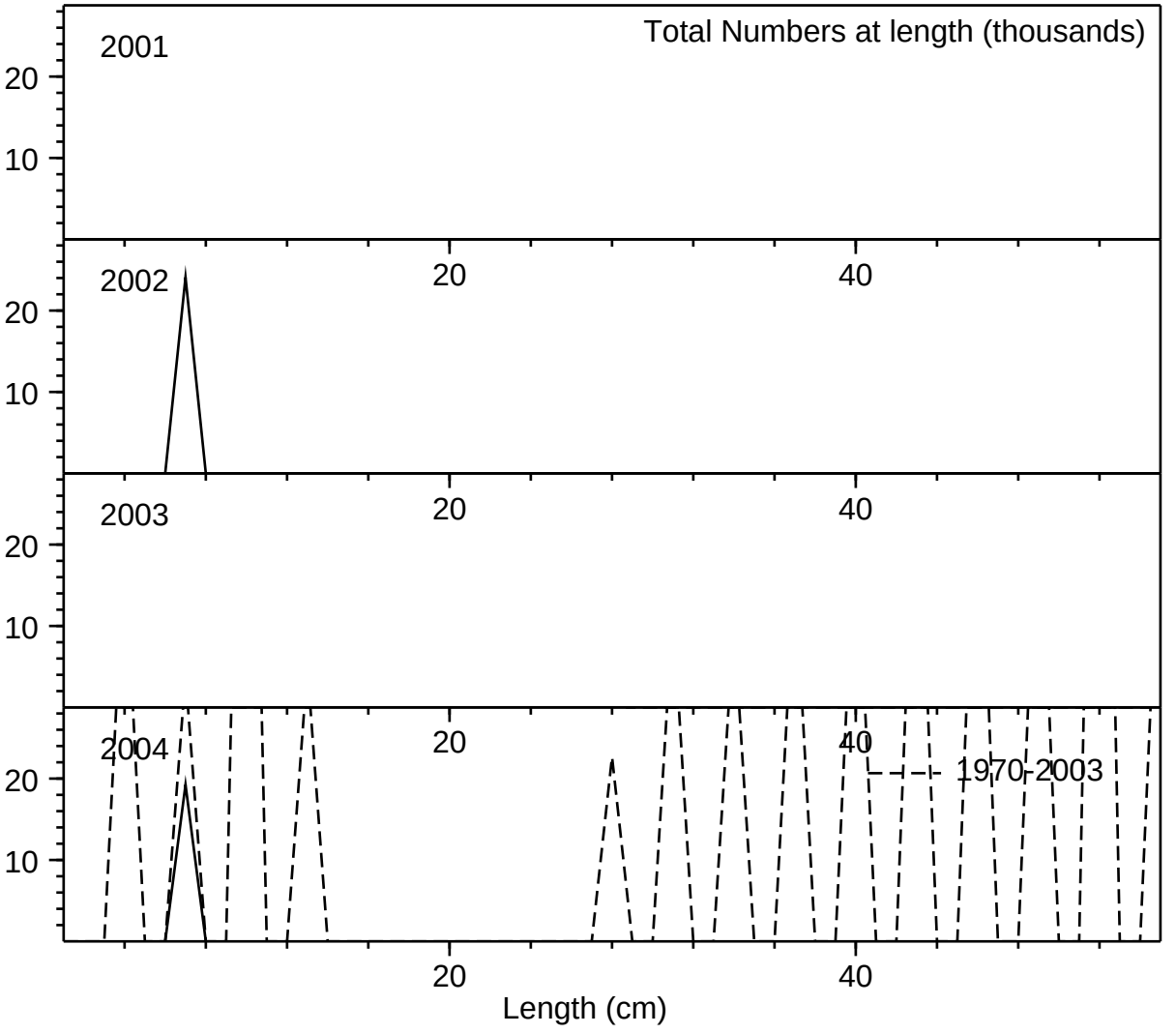

Fig. 98. 4VW Lumpfish length frequency distribution from the SUMMER Groundfish surveys.

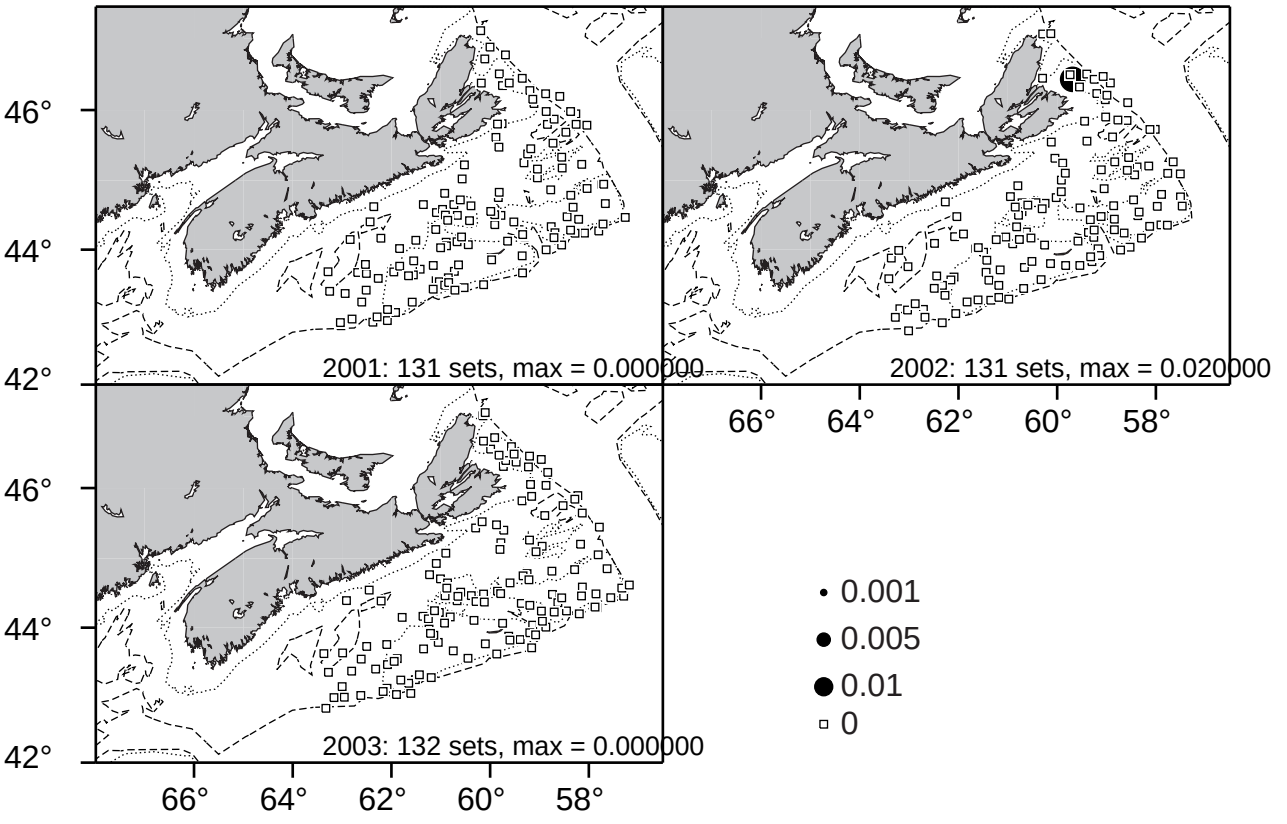

Fig. 99. 4VW Lumpfish Biomass (kg/tow) from the 2001-2003 SUMMER Groundfish Surveys.

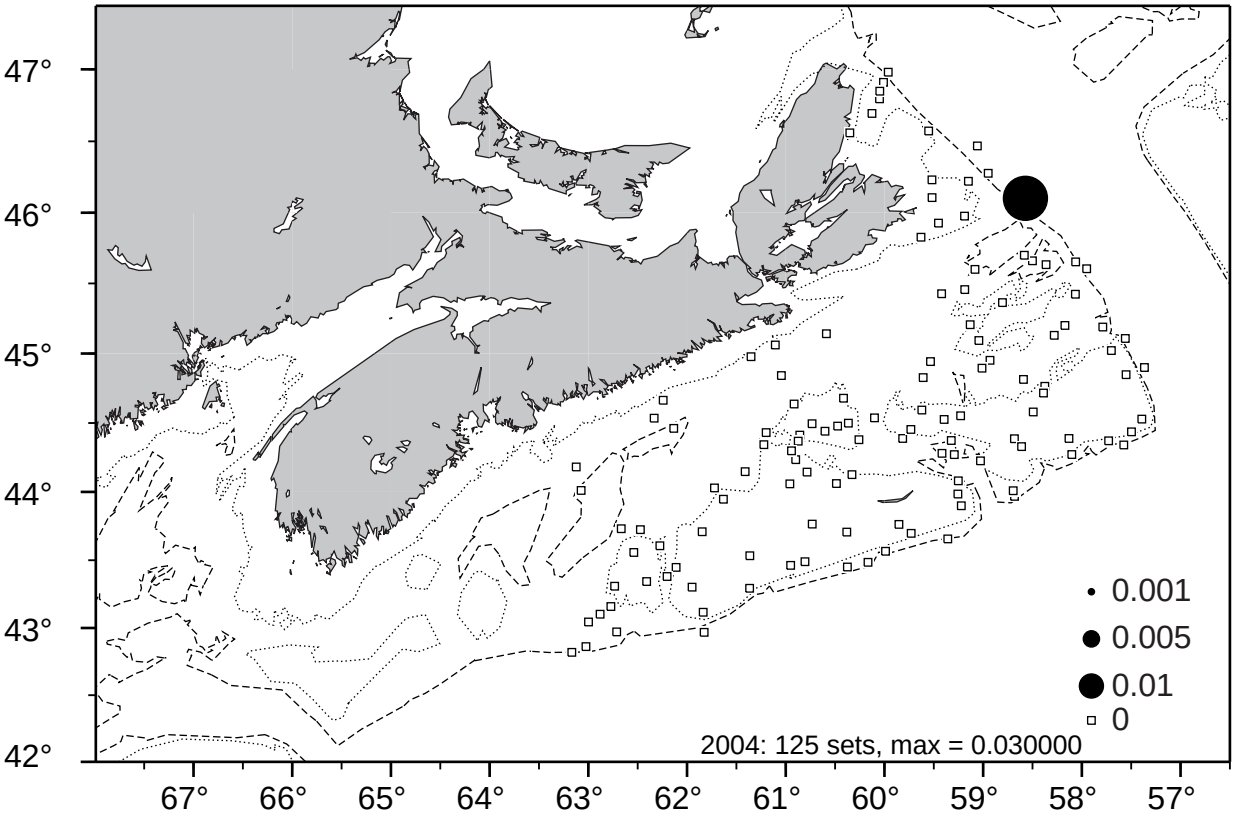

Fig. 100. 4VW Lumpfish Biomass (kg/tow) from the 2004 SUMMER Groundfish Survey.

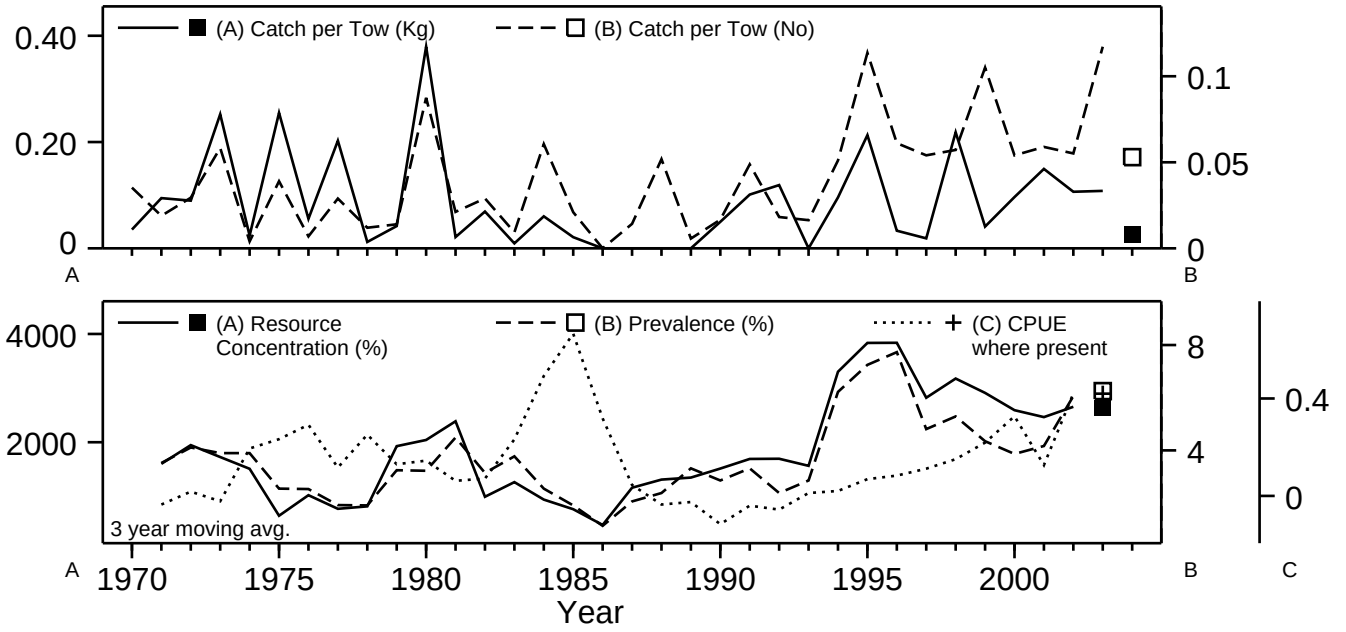

Fig. 101. 4X Lumpfish stratified mean weight caught per tow, stratified mean number caught per tow, resource concentration, prevalence, CPUE where present (log number/tow) from the SUMMER Groundfish surveys. The catch for 2004 was sampled using the MV Teleost. It has not been calibrated, and should not be compared to the earlier time series.

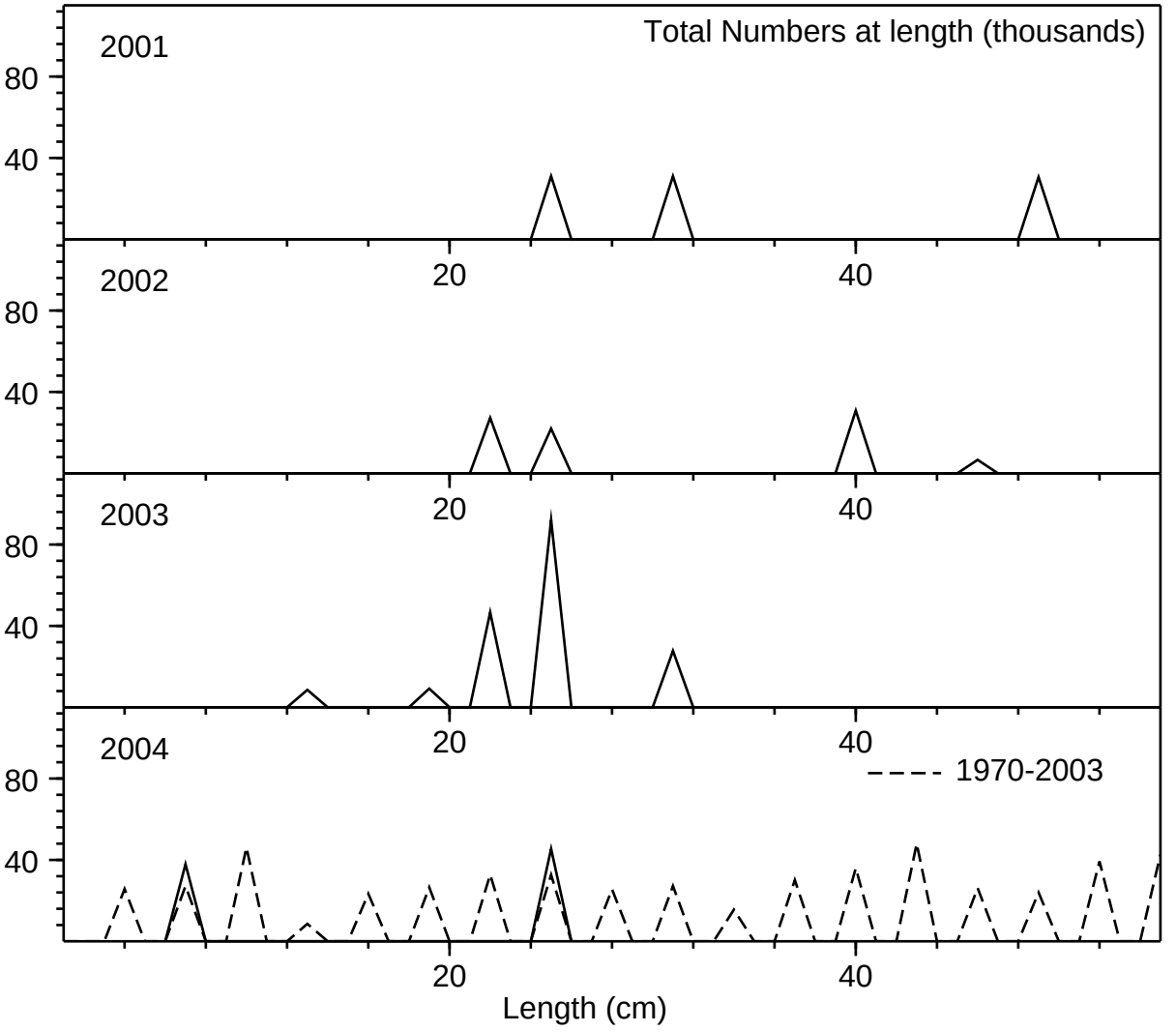

Fig. 102. 4X Lumpfish length frequency distribution from the SUMMER Groundfish surveys.

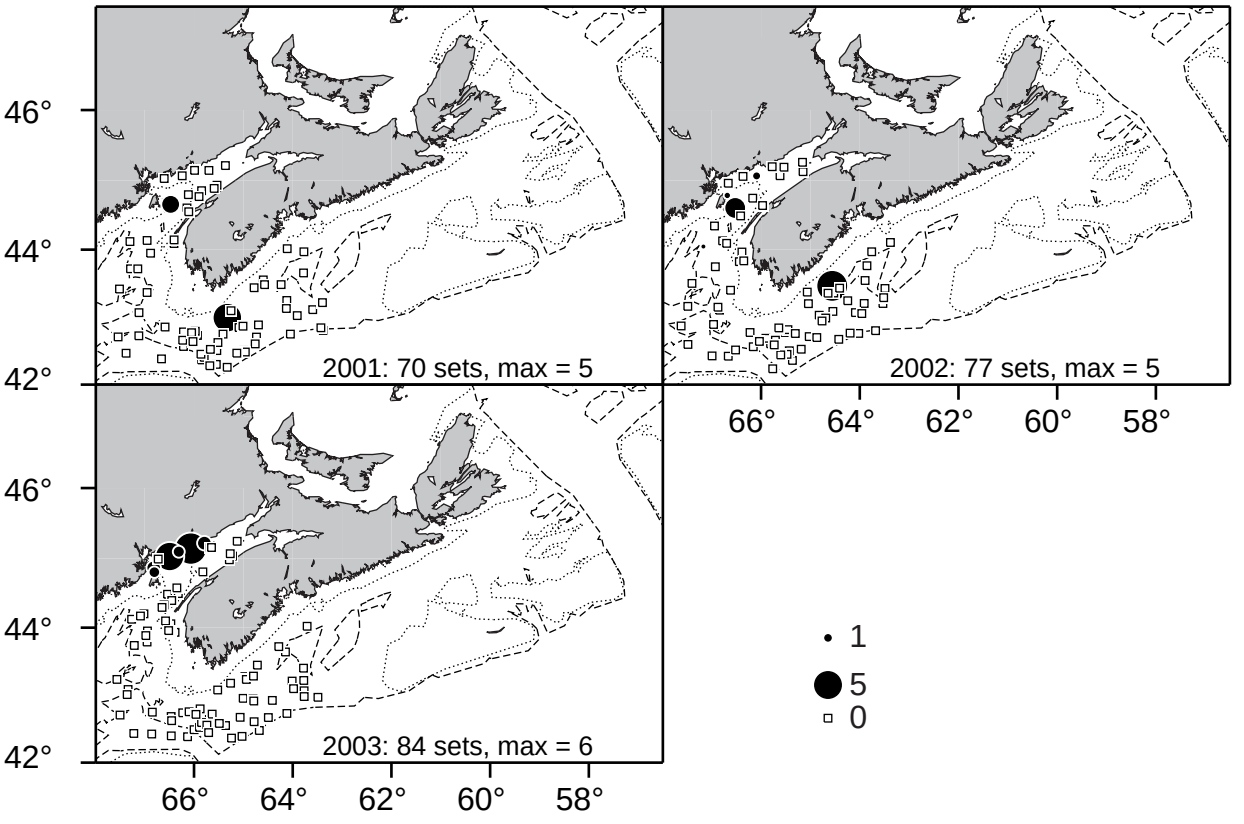

Fig. 103. 4X Lumpfish Biomass (kg/tow) from the 2001-2003 SUMMER Groundfish Surveys.

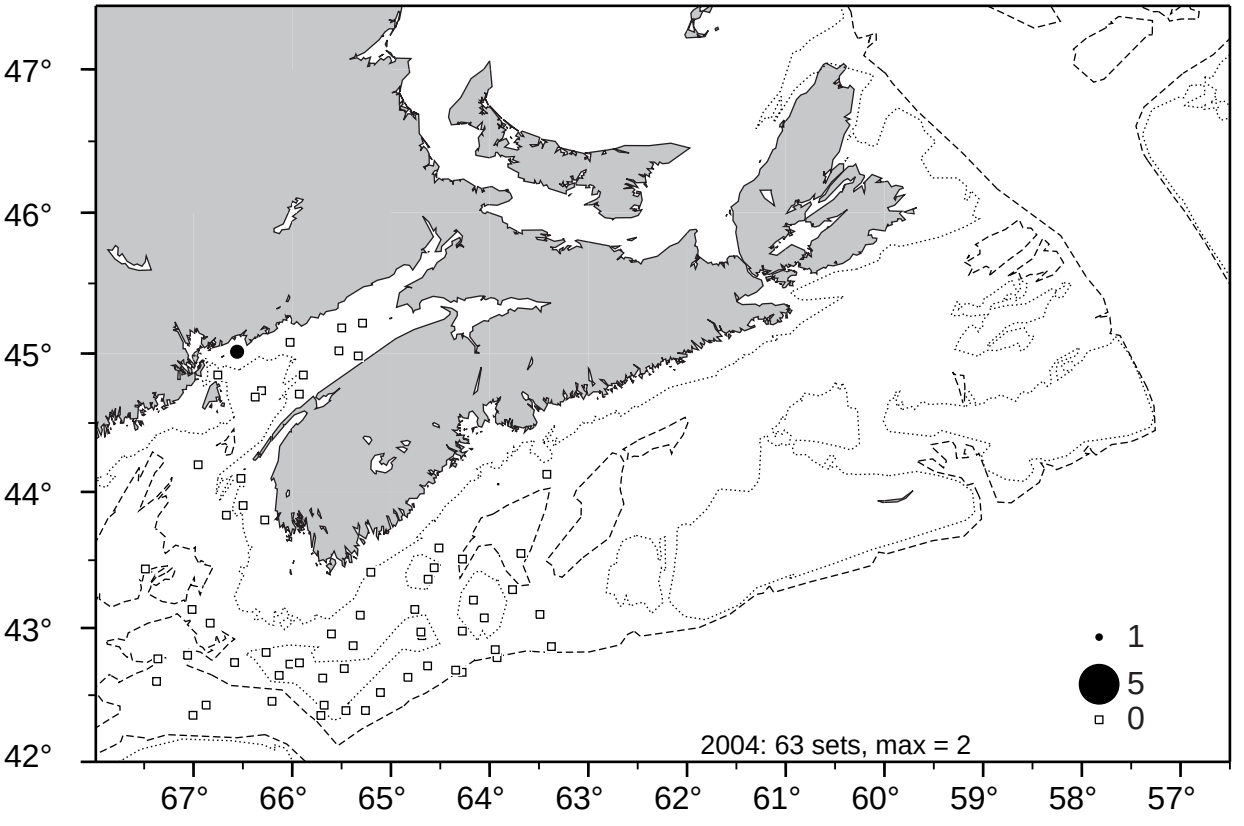

Fig. 104. 4X Lumpfish Biomass (kg/tow) from the 2004 SUMMER Groundfish Survey.

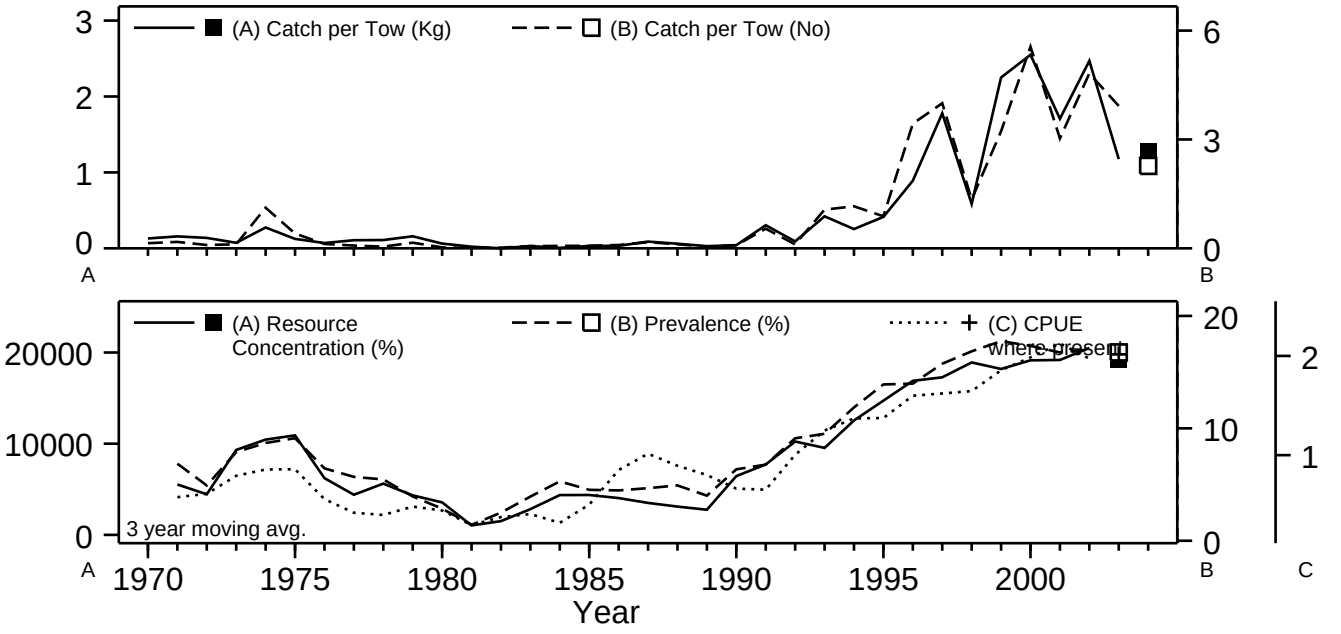

Fig. 105. 4VW Turbot stratified mean weight caught per tow, stratified mean number caught per tow, resource concentration, prevalence, CPUE where present (log number/tow) from the SUMMER Groundfish surveys. The catch for 2004 was sampled using the MV Teleost. It has not been calibrated, and should not be compared to the earlier time series.

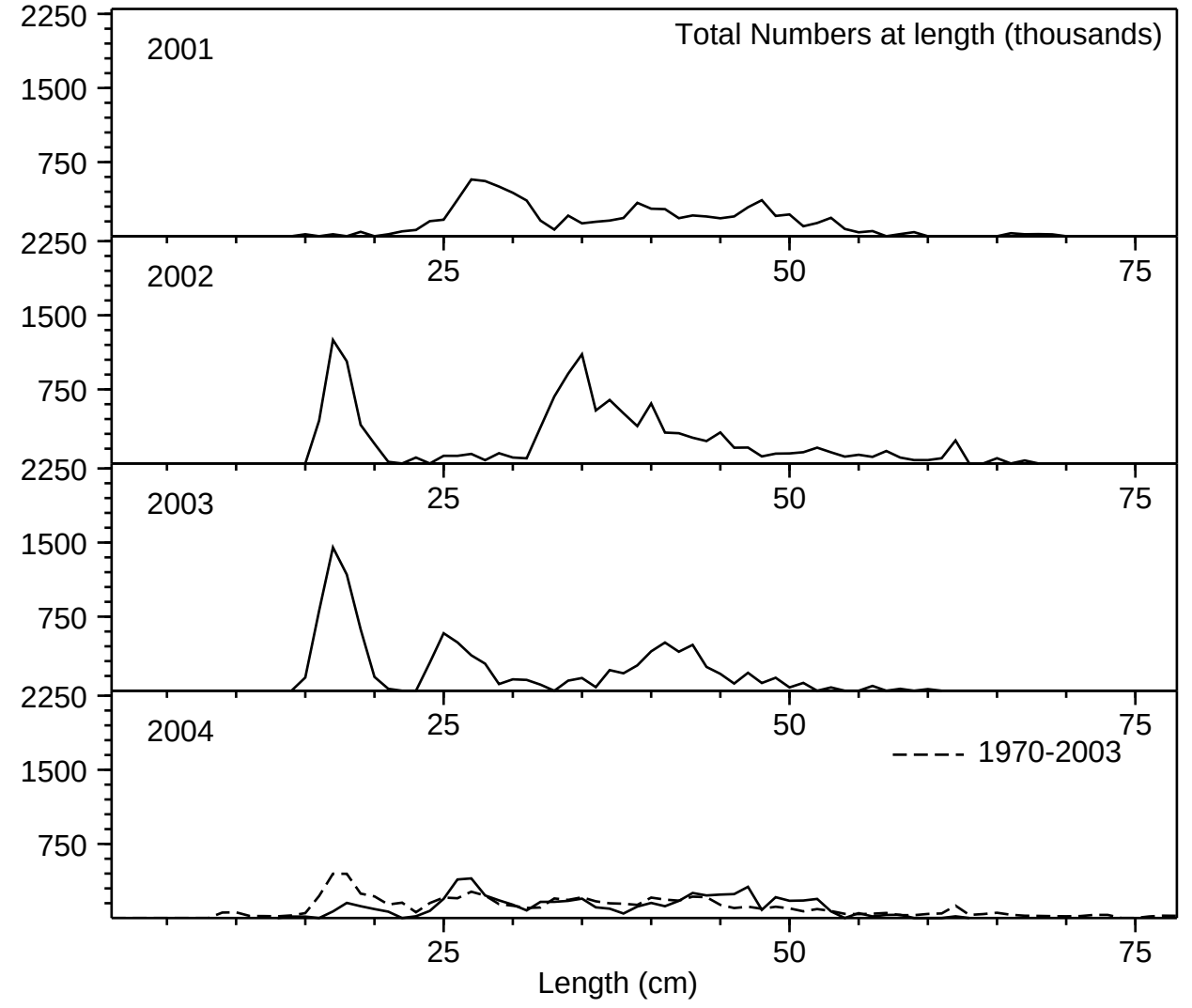

Fig. 106. 4VW Turbot length frequency distribution from the SUMMER Groundfish surveys.

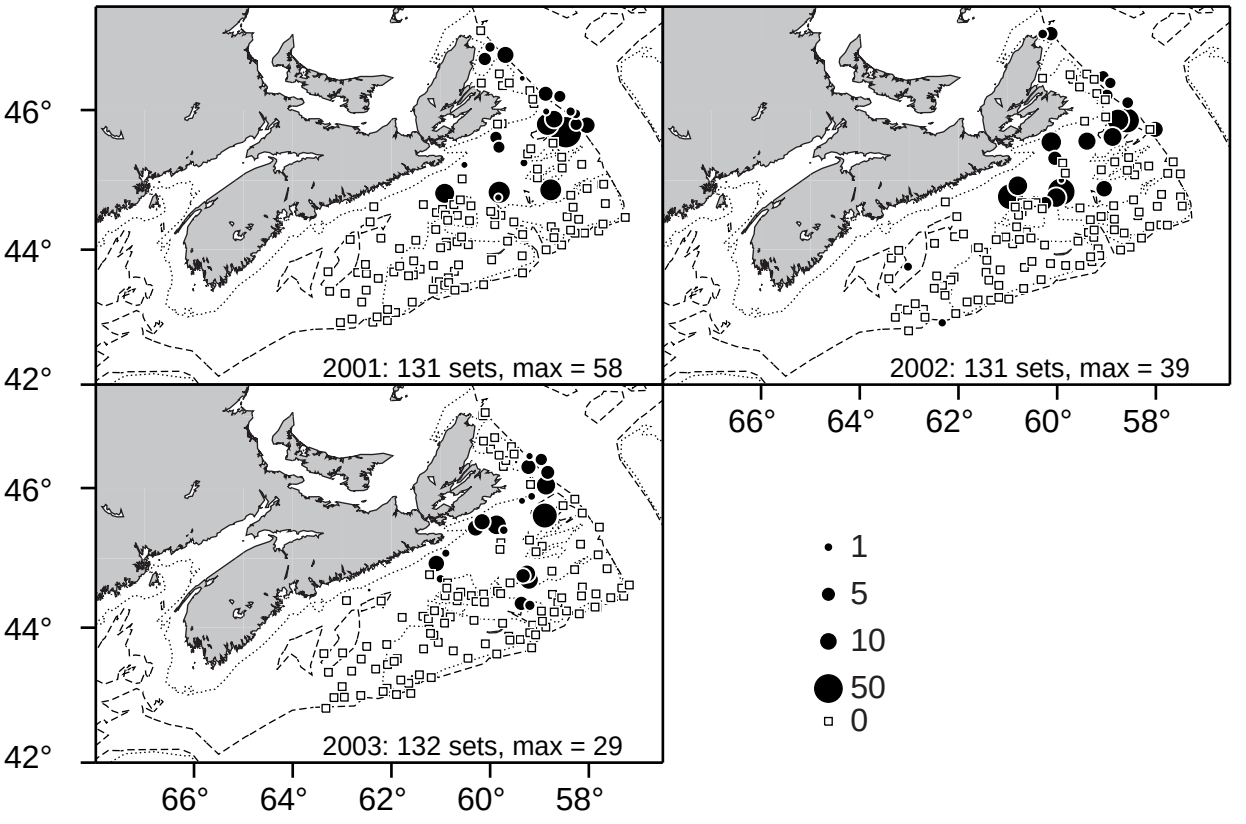

Fig. 107. 4VW Turbot Biomass (kg/tow) from the 2001-2003 SUMMER Groundfish Surveys.

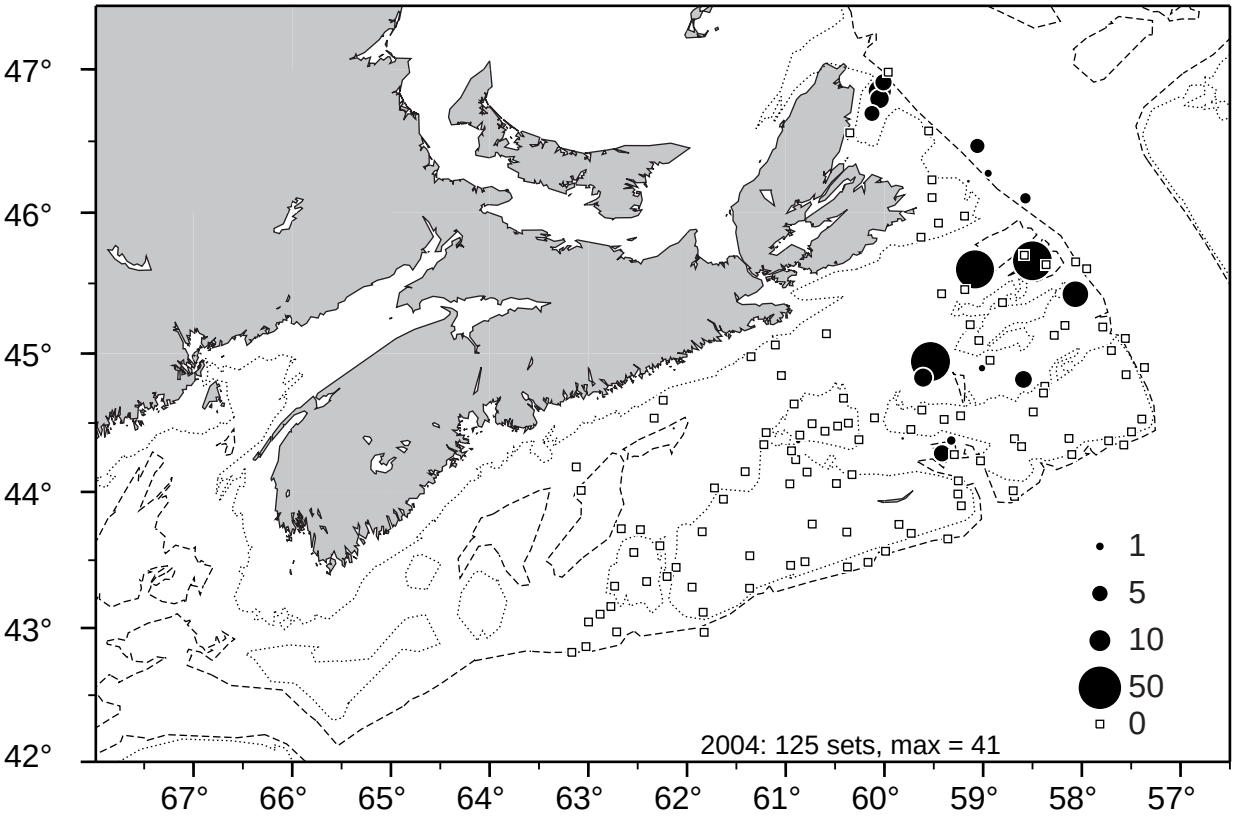

Fig. 108. 4VW Turbot Biomass (kg/tow) from the 2004 SUMMER Groundfish Survey.

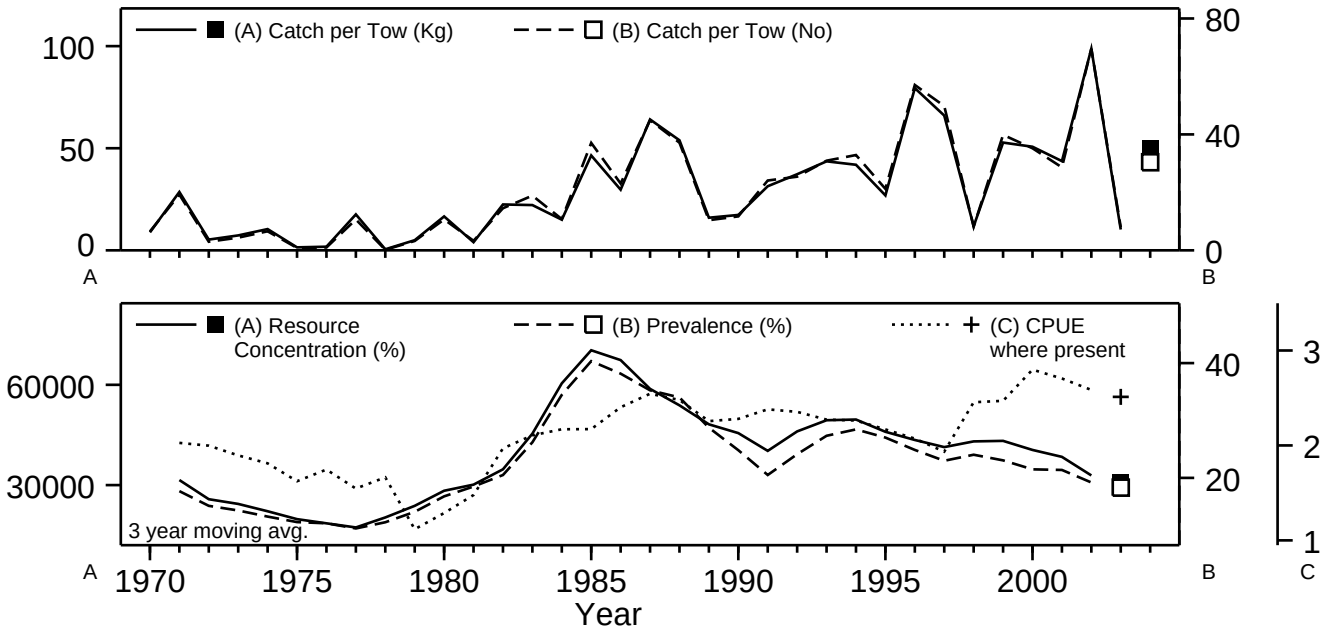

Fig. 109. 4VWX Spiny Dogfish stratified mean weight caught per tow, stratified mean number caught per tow, resource concentration, prevalence, CPUE where present (log number/tow) from the SUMMER Groundfish surveys. The catch for 2004 was sampled using the MV Teleost. It has not been calibrated, and should not be compared to the earlier time series.

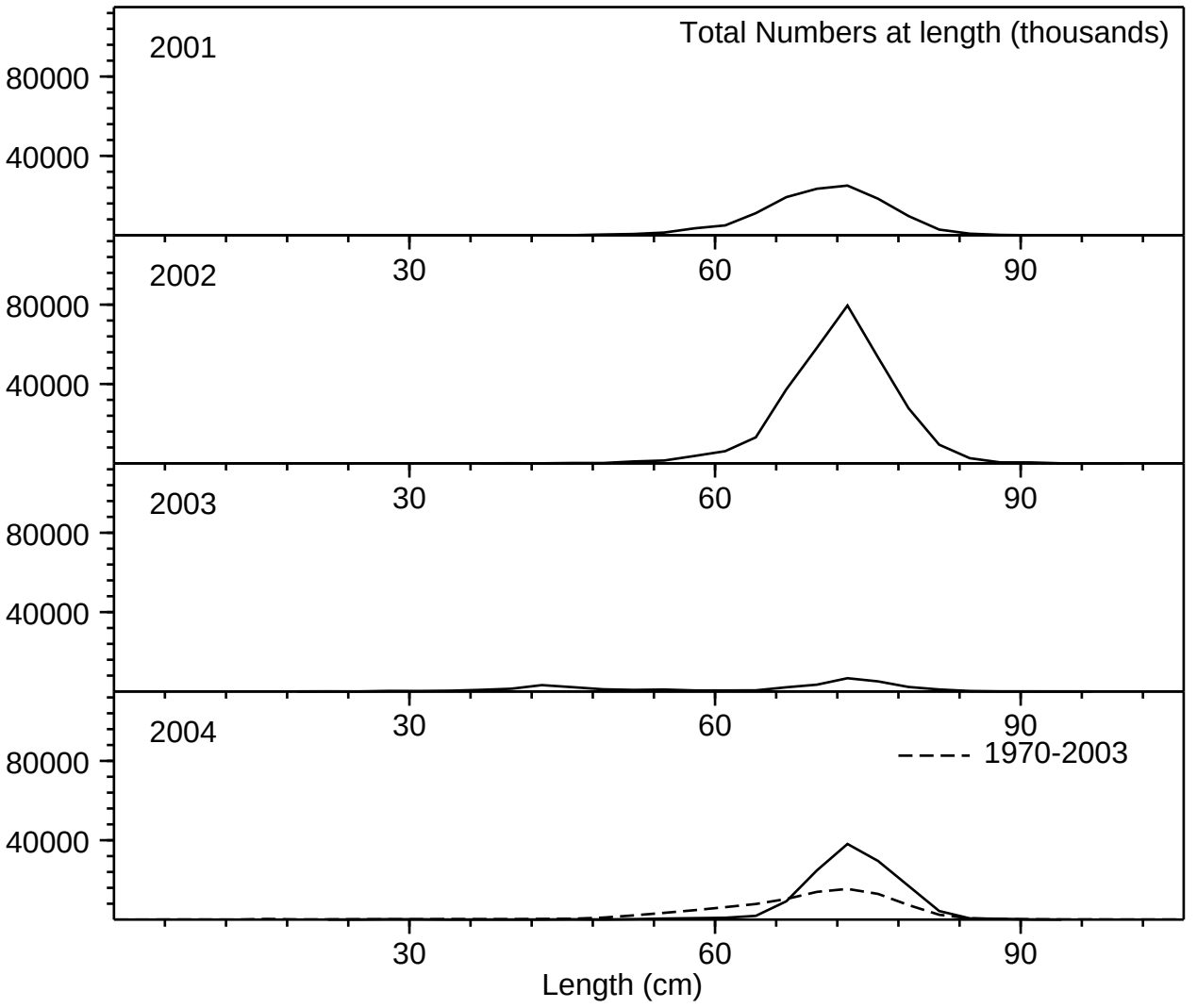

Fig. 110. 4VWX Spiny Dogfish length frequency distribution from the SUMMER Groundfish surveys.

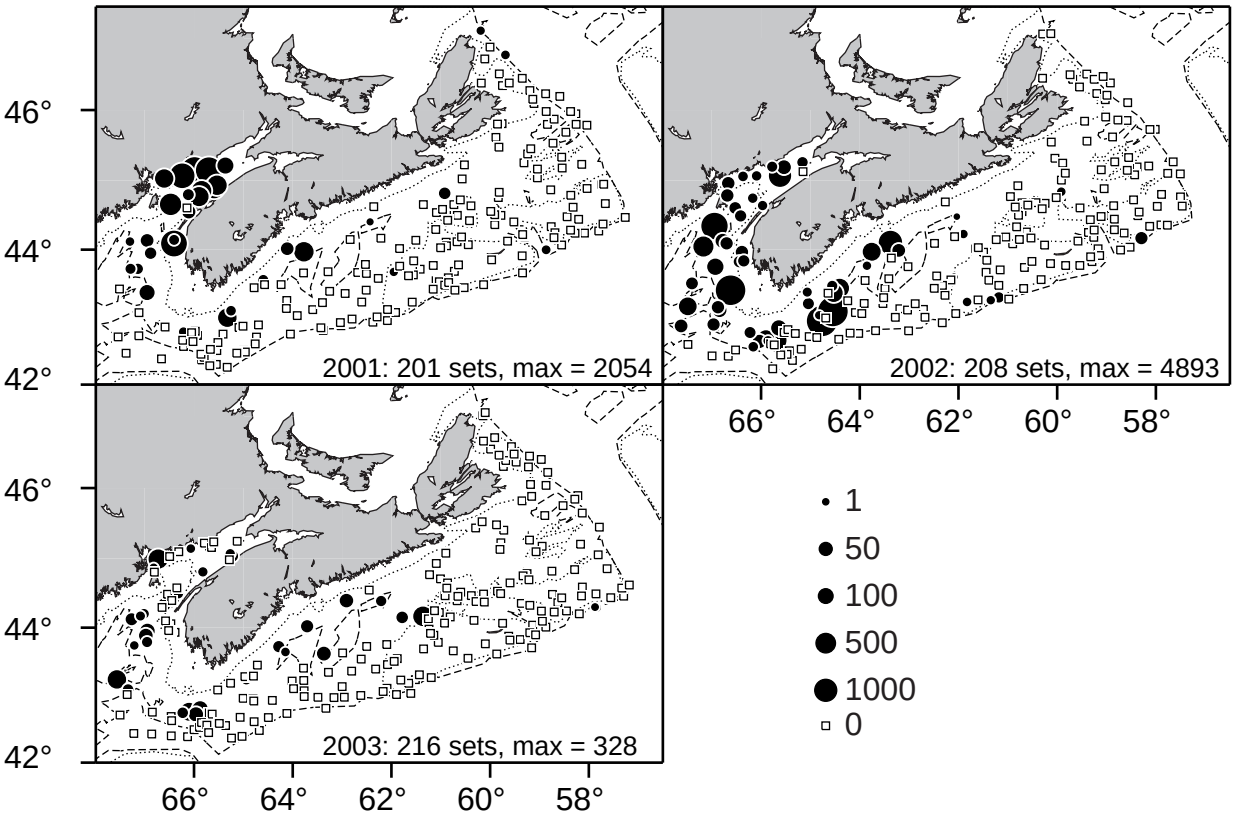

Fig. 111. 4VWX Spiny Dogfish Biomass (kg/tow) from the 2001-2003 SUMMER Groundfish Surveys.

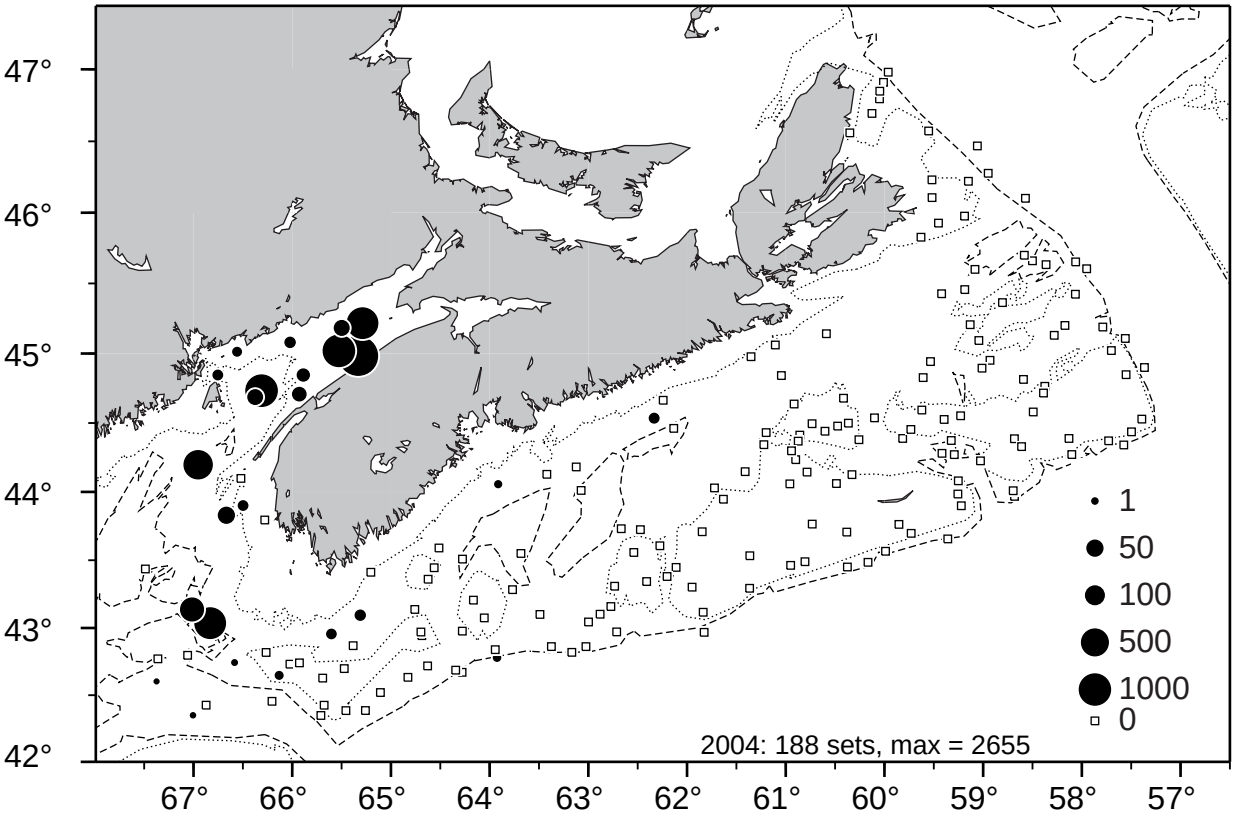

Fig. 112. 4VWX Spiny Dogfish Biomass (kg/tow) from the 2004 SUMMER Groundfish Survey.